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ACUTE LYMPHOCYTIC MENINGITIS*

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WALLGREN, in 1925 and 1926, described a new syndrome of central nervous system infection under the title of acute aseptic meningitis. He reviewed the reports of two epidemics which had occurred in France in 1910 and 1913 and which were supposed to have been an abortive type of poliomyelitis, and similar epidemics in Europe in 1922 and 1923 which had been diagnosed mild cases of encephalitis. The characteristic symptoms of these cases were severe headaches with neck rigidity and other evidences of meningeal irritation with ultimate recovery. Wallgren reported several similar cases and emphasized the importance of the typical spinal fluid findings.

Since then other cases have been reported in increasing numbers both in Europe and in this country. Many names have been suggested but the terms, acute lymphocytic meningitis or acute aseptic meningitis, have been most universally adopted. Viets and Watts published the first three cases in this country in 1929. Thorson reported the first case in this state in 1936 and stated that two cases had occurred at the University Hospital and five at the Minneapolis General Hospital.

Although the disease is still considered by some as an abortive form of the meningitic type of epidemic encephalitis, the course of the disease and the characteristic spinal fluid findings make it a distinct clinical entity.

The onset is usually quite sudden, rarely with convulsions. Headache is frequently the first symptom, increasing in intensity, so that the patient becomes bedridden within a few days. This is associated with nausea and vomiting, and oc-

asionally photophobia. About this time neck rigidity manifests itself and the clinical picture is quite suggestive of a tuberculous meningitis with which it is frequently confused.

Repeated spinal fluid studies, however, enable one to arrive at the correct diagnosis. The spinal fluid is usually clear and under normal or slightly increased pressure. The cell count varies from a moderate increase to over 1000, depending on the severity of the disease. Most of the cells are small lymphocytes, in many cases 100 per cent. In the early stage of the disease, although the lymphocytes predominate, one may encounter polymorphonuclear leukocytes. These may be as high as 35 per cent although usually in smaller numbers, and are an index of the severity of the infection. The protein frequently shows a slight increase. The characteristic diagnostic findings, however, are that the spinal fluid sugar remains within normal limits during the entire course of the disease (50 to 75 mgm. per 100 c.c.), as do also the chlorides (720 to 750 mgm. per 100 c.c.). The colloidal gold curve is usually in the meningitic zone. In one of our cases (Case three), however, it gradually shifted from the meningitic to the syphilitic zone and finally gave a definite paretic curve. Viets and Watts and Warren reported similar findings in two of their cases. Although the spinal fluid does not contain clots, several cases have been reported where a delicate fibrin web developed several hours after its removal similar to what occurs so characteristically in tuberculous meningitis. No organisms have been found on smear, culture or guinea pig inoculation. A moderate leukocytosis is frequently found in the blood during the early stage of the disease.

*Read at the annual meeting of the Southern Minnesota Medical Association at Winona, Minnesota, August 11, 1937.

The course is usually a benign one. The temperature gradually subsides, the irritative meningeal signs disappear and the spinal fluid findings gradually return to normal. Repeated spinal drainage favorably influences the course of the disease and should be performed in every case. In the severe cases, delirium and even prolonged psychotic symptoms may manifest themselves, with an ultimate favorable outcome. Cranial nerve palsies or other organic signs are infrequent or only transient when present; choked discs may occur early in the course of the disease.

In contrast to encephalitis, these patients rarely develop any late manifestations or sequelæ. This is considered an important differential diagnostic point. Complete recovery is the rule. Only one death has been reported in the literature. A patient observed by Viets and Warren died on the fourteenth day of his illness, immediately after his second convulsion. Post-mortem studies revealed extensive perivascular infiltration and slight ganglion cell changes throughout the central nervous system, indicative of a marked encephalitis as well as meningitis. Although the nervous tissue reaction was a severe one, the authors felt that the pathologic appearance did not preclude recovery.

Acute lymphocytic meningitis usually develops in isolated cases. However, epidemics have been reported suggesting an infectious origin. Anderson and Wolff think that this disease has become more prevalent since 1920 than epidemic encephalitis. If this is true, it has not been recognized in the majority of instances. Eckstein reported an interesting epidemic of thirteen cases at Dusseldorf in 1930. Toomy reported a group of seventy cases occurring in an orphanage which housed three hundred and sixty male children and sixty-five adults. These cases developed within a period of twenty-one days. The clinical picture, spinal fluid findings and course of the disease were quite typical of acute lymphocytic meningitis. However, the blood picture examined in eighteen cases revealed a leukopenia with a high relative lymphocytosis. In a small percentage, a hemolytic streptococcus was obtained from throat cultures. In his paper Toomy states that twenty-five similar cases had been observed by Currier of Grand Rapids, Michigan, and fourteen cases by Ashton of Beckly, West Virginia. Dummer et al reported a small epidemic occurring

in a group of twenty-two children during 1935.

Although no definite etiologic factors have been found in this type of meningitis, Scott and Rivers reported two cases in which a filtrable virus was obtained. The etiologic agent was isolated from the spinal fluids of these patients, and their serums possessed neutralizing antibodies for at least one hundred lethal doses of the virus from nine to eleven weeks after the clinical onset of the disease. However, in some typical cases this virus could not be demonstrated. Dominick reported three cases, two of which contained antibodies for the virus. He suggests that in those cases of lymphocytic meningitis where the organism is found or when the neutralization tests of the serum have positive results the term lymphocytic choriomeningitis should be employed. Rivers and Scott have further demonstrated that acute lymphocytic meningitis may be caused by etiologic agents other than this virus.

In the differential diagnosis, one must consider:

1. The various types of purulent meningitis which can be readily excluded from spinal fluid studies.
2. The abortive forms of poliomyelitis which may offer considerable difficulty except that in the early stages, polymorphonuclear cells frequently predominate in the spinal fluid.
3. The cases of meningismus associated with acute otitis media and other acute systemic infections, in which the etiologic factor can readily be determined.
4. Tuberculous meningitis where a decrease in sugar and chlorides in the spinal fluid and the findings of the organism confirm the diagnosis.
5. The meningitic form of epidemic encephalitis which frequently offers the most difficult problem. The presence of localizing signs and lethargy, the sugar increase in the spinal fluid when present, and some manifestations of sequelæ are important diagnostic indications.
6. Syphilitic meningitis, which can be readily diagnosed from the positive spinal fluid findings.

We have observed seven cases during the past year, three of which are reported to illustrate the variations in the severity of the disease. One of our cases referred by Dr. L. N. Bergh of Montevideo, Minnesota, had a typical severe course of acute lymphocytic meningitis of four

ACUTE LYMPHATIC MENINGITIS—HAMMES

weeks duration. During this period he had two convulsions. With the improvement in his meningitis, he developed a psychosis associated with delusions and hallucinations. He gradually improved and made a satisfactory recovery after four months.

Case 1.—A woman, aged thirty-nine, was admitted to the neurological service at Ancker Hospital on March 15, 1937. The family and personal history were negative except that the patient has always been mentally deficient. She completed the fifth grade at the age of sixteen. Because of her mentality it was difficult to obtain an accurate history. Apparently she developed a headache on March 12, 1937, which gradually grew worse. The next day she began to vomit. These two symptoms became more pronounced. She complained of vertigo and backache and was admitted to the hospital three days after the onset of her illness. The physical examination was negative. X-ray of sinuses and mastoids and lungs revealed no pathology.

The neurological examination was negative except for a rigid neck, and a moderate increase of all deep reflexes. The Kernig was negative. The blood count was normal, leukocytes 9,750. The urine was normal. The blood Wassermann and Kahn tests were negative. Twenty-five c.c. of clear spinal fluid under normal pressure were removed. The fluid contained a trace of globulin, 269 cells (94 per cent lymphocytes, 6 per cent polymorphonuclear); chlorides 704 mg. per 100 c.c.; sugar 78 mg. The spinal fluid Wassermann was negative; the colloidal gold curve negative; no organisms were found. The temperature and pulse were normal.

A provisional diagnosis of tuberculous meningitis was made. During her stay at the hospital the temperature was normal except on the second day when it was 100.6 for twenty-four hours. Her symptoms gradually subsided and she was discharged as recovered on her twenty-first hospital day.

Five spinal punctures were done.

Date	Cells	Chlorides	Sugar
March 16, 1937	269		
	94 per cent lymphocytes	704 mg.	78 mg.
March 17, 1937	790		
	90 per cent lymphocytes	712 mg.	72 mg.
March 19, 1937	647		
	all lymphocytes	708 mg.	74 mg.
March 25, 1937	172		
	all lymphocytes	706 mg.	78 mg.
March 27, 1937	28		
	all lymphocytes	710 mg.	70 mg.

Two months later she reported to the out-patient department because of a discharging right ear. This cleared up in ten days. There were no other symptoms or complaints.

Case 2.—A laborer, aged twenty-one, was admitted to the neurological service at Ancker Hospital on September 21, 1936. His family and personal history were negative. His present illness began about 10 A. M. on September 20, 1936, while helping a neighbor dig a basement. He developed a severe headache, throbbing in character which rapidly grew worse so that he had to discontinue work after two hours. He went to bed

and two hours later began to have attacks of vomiting of a projectile type. About this time he noticed some neck rigidity. All these symptoms became more pronounced and he was brought to the hospital at 2 A. M. on September 21, 1936. At the time of admission his temperature was 102, pulse 100, respiration 24. The physical examination was negative except for a slightly injected throat. The neurological examination revealed marked neck rigidity and a positive Kernig sign. All cranial nerves were normal. All deep reflexes were moderately decreased, the left Babinski questionably positive. He complained of pain and tenderness in the muscles of both lower extremities.

The urine was normal; blood count normal except for a leukocytosis of 26,000; blood pressure, systolic 120, diastolic 70. A lumbar puncture made at 4 A. M. on September 21, 1936, revealed a slightly cloudy fluid and under slightly increased pressure. Sixty c.c. were withdrawn.

The spinal fluid contained 314 cells, all lymphocytes; chlorides 715 mgs. per 100 c.c.; globulin one plus; spinal sugar 83 mg.; Wassermann and Kahn negative; colloidal gold curve 0000012200, no organisms; protein 46 mg. A tentative diagnosis of acute poliomyelitis was made and 20 c.c. of convalescent polio serum was administered intramuscularly.

Course: Following the spinal drainage his headache and vomiting improved. On September 22, 1936, a cisternal puncture was performed and the spinal fluid contained 251 cells, mostly lymphocytes. His general condition improved, the temperature gradually became lower, was normal on the fifth day and remained so. The rigid neck and Kernig gradually disappeared, his symptoms subsided and he was discharged on October 24, 1936, thirty-four days after his admission to the hospital, apparently recovered. He was seen in the out-patient department three weeks later at which time he had no complaints nor abnormal findings. His leukocytosis dropped to normal after the third day. Eight spinal punctures were done, the last one on October 13, 1936.

Date	Cells	Chlorides	Sugar
September 21, 1936	314 all lymphocytes	715 mg.	73 mg.
September 22, 1936	251, 90% lymphocytes	720 mg.	74 mg.
September 25, 1936	340, 90% lymphocytes	740 mg.	75 mg.
September 28, 1936	462 all lymphocytes	690 mg.	..
October 3, 1936	460 all lymphocytes	710 mg.	72 mg.
October 5, 1936	192, 90% lymphocytes	750 mg.	70 mg.
October 7, 1936	188, 90% lymphocytes	720 mg.	..
October 13, 1936	36, 70% lymphocytes	720 mg.	..

Case 3.—A negro, a Pullman porter, aged thirty-five, was admitted to the neurological service at the Ancker Hospital on July 6, 1936. His family history was negative. His personal history was negative except that he contracted gonorrhea in 1928 and a chancre in 1929 for which he had received four "arm shots" and two "hip shots." His present illness began six days prior to admission to the hospital. On July first he had several severe chills, fever, and "ached all over." Soon after he developed severe headache, pain and stiffness in the neck and back and generalized weakness. He had some nausea and had been very constipated since the onset of his illness.

The physical examination was negative. The neuro-

ACUTE LYMPHATIC MENINGITIS—HAMMES

logical examination was negative except for a rigid neck, a positive Kernig and generalized tenderness. All cranial nerves, including the pupils, and all reflexes were normal. His temperature was 102.6; pulse 128; urine and blood count were normal except a leukocytosis of 12,450; blood Wassermann negative.

were found on smear, culture or guinea pig inoculation. After the paretic colloidal gold curve developed, the patient was placed on antisyphilitic treatment without any appreciable effect on the serology of the spinal fluid. Clinically he had recovered and left the hospital December 9, 1936.

Date	Cells	Chlorides	Sugar	Colloidal Gold Curve
July 7, 1936	1230	658	72	0000123310
July 8, 1936	65 per cent lymphocytes	690	70	0001332000
July 9, 1936	733	720	70	0023332000
July 15, 1936	807	712	67	.....
July 20, 1936	2170	695	55	.....
July 20, 1936	all lymphocytes	740	65	0000044550
August 20, 1936	573	...	...	4555554331
August 20, 1936	all lymphocytes	710	45	4555532100
September 15, 1936	331	...	48	4554432100
October 7, 1936	all lymphocytes	...	...	...
November 6, 1936	166	...	...	...
	66	...	...	...
	34	...	...	...

The spinal fluid was somewhat cloudy under increased pressure and 30 c.c. were removed. It contained a 2 plus globulin, 1,230 cells, 65 per cent lymphocytes and 35 per cent polymorphonuclears; chlorides 698 mg.; sugar 72 mg.; Wassermann and Kahn negative; colloidal gold curve 0000123310. Smear and cultures were negative for organisms. Immediately following the spinal drainage 30 c.c. of antimeningococcic serum were given intraspinally and intravenously because of the diagnosis of meningitis suspect.

Course: During the first eight days the temperature fluctuated between normal and 102 and pulse around 110. He was semi-delerious, extremely restless, had an occasional involuntary urination and complained of severe pain and neck rigidity. Because of the restlessness and confusion he had to be kept in restraint. All these symptoms gradually subsided as the temperature continued to be normal after July 14. From July 15 to July 27, two weeks after the onset of his illness, he complained of numbness and weakness of the right upper extremity and had some loss of motor strength of the right shoulder girdle muscles. This slowly improved and by August 14 he was up and felt well, but was kept in the hospital because of the continued pleocytosis in the spinal fluid.

Daily spinal drainage was performed during the first ten days and at frequent intervals thereafter. A total of thirty-four lumbar punctures was made, the last one on November 6, 1936. The highest cell count was 2,170 on July 15 and the lowest thirty-four on November 6; the lymphocytes varied from 60 to 95 per cent, while the remaining cells were mostly polymorphonuclear leukocytes. During the first ten days the spinal fluid was slightly cloudy, then became yellowish for a short period and then clear. The colloidal gold curve was in the meningitic zone until September 15, then quite rapidly extended into the syphilitic zone, and on three occasions presented a paretic curve. The Wassermann and Kahn were negative at all times; the sugar and chlorides were normal throughout; no organisms

Although this patient gave a positive syphilitic history, the normal pupillary findings and the negative Wassermann and Kahn, both in the blood and spinal fluid, exclude syphilis as the etiologic agent. However, it may have been a contributing factor in prolonging the pleocytosis in the spinal fluid.

Conclusions

1. Acute lymphocytic meningitis is a definite clinical entity characterized by symptoms of meningeal irritation, typical spinal fluid findings and a favorable outcome with repeated spinal drainage.

2. The etiologic agent evidently is a filtrable virus isolated by Scott and Rivers.

3. Seven cases have been observed by the author. Three are reported in detail.

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References

1. Dominick, D.: Lymphocytic choriomeningitis. *Jour. Am. Med. Assn.*, 109:247-250, (July 24) 1937.
2. Dummer, C. M., Lyon, R. A., and Stevenson, F. E.: Benign lymphocytic meningitis. *Jour. Am. Med. Assn.*, 108: 633-636, (Feb. 20) 1937.
3. Eckstein, A.: Epidemische meningitis serosa. *Klin. Wchnschr.*, 10:22-24, 1931.
4. Scott, T. F., and Rivers, T. M.: Meningitis in man caused by a filtrable virus. *Jour. Exp. Med.*, 63:397-414, (March) 1936.
5. Scott, T. F., and Rivers, T. M.: Meningitis in man caused by a filtrable virus. *Jour. Exp. Med.*, 63:415-432, 1936.
6. Thorson, O. P.: Benign lymphocytic meningitis or acute aseptic meningitis. *Minn. Med.*, 19:664-68, (Oct.) 1936.
7. Toomy, J. A.: Acute lymphocytic meningitis. *Jour. Pediat.*, 8:148-153, (Feb.) 1936.
8. Viets and Warren: Acute lymphocytic meningitis. *Jour. Am. Med. Assn.*, 108:357-61, (Jan. 30) 1937.
9. Viets, H. R., and Watts, J. W.: Acute aseptic meningitis. *Jour. Nerv. and Ment. Dis.*, 80:253-73, (Sept.) 1934.
10. Viets, H. R., and Watts, J. W.: Three cases of aseptic (lymphocytic) meningitis. *New England Jour. Med.*, 200: 633-34, (March) 1929.
11. Wallgren, A.: Eine eigenartige Form von epidemischer Meningitis. (Meningitis aseptica acuta.) *Wien. Arch. f. inn. Med.*, 12:297-312, (Feb.) 1926.

THE PRESENT STATUS OF THE INSULIN-HYPOGLYCEMIA TREATMENT IN SCHIZOPHRENIA*

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INSULIN-HYPOGLYCEMIA therapy for schizophrenia is in the forefront of medical thought today. As a result of the enthusiastic reports of Sakel and his followers, both here and abroad, and because of the favorable publicity given the treatment in the lay press, public interest has been aroused to a high pitch. Medical men and hospitals are being flooded by requests from anxious relatives to employ the treatment on their beloved ones who have fallen prey to this tragic malady.

In spite of the extraordinary claims for the insulin-shock treatment it appears premature to draw final conclusions regarding the ultimate value of this form of therapy. We have been impressed by the wisdom of the attitude of the Committee on Public Education of the American Psychiatric Association which in February, 1937 issued the following statement: "It is hoped and may prove to be a fact that the so-called insulin-shock treatment for dementia præcox will find a useful place among the forms of treatment for dementia præcox, but its exact value has yet to be determined and it can be definitely stated that it is not a specific, nor by any means a cure for all cases of dementia præcox. It would be a source of regret should the insulin-shock treatment be a means of holding out a false hope to the families of tens of thousands of sufferers from dementia præcox when this hope most certainly cannot be widely realized with the present-day knowledge of insulin therapy."

A survey of the medical literature reveals reports of some very glowing results in the treatment of schizophrenia by insulin-shock therapy. Thus Sakel¹⁷ reported more than 70 per cent of complete remissions in cases of early schizophrenia. Müller's^{13, 14} report of more than 300

cases reveals even better results. Berglas and Süsić¹ said that in a total of eighty-five cases 70 per cent of patients who had early schizophrenia obtained complete remission. At the meeting of the American Psychiatric Association in Pittsburgh in May of this year, figures of a very similar nature were reported. Summing up the various figures a fair statement would be about as follows: In cases in which the psychosis is of less than six months' duration, the recovery rate is said to be from 60 to 80 per cent; if the psychosis has been present between six and eighteen months, the recovery rate is 30 to 50 per cent, and in cases of chronic schizophrenia the recovery rate is 10 to 20 per cent.

Thus far but few voices have been raised in protest. Professor Berze,² Lichter and Lichter,¹¹ Langenfeldt⁹ of Oslo, Adolf Meyer¹² and a few others have cautioned against accepting the claims of those who have reported so encouragingly on the results of the treatment.

We hold no brief for either side in this controversy. Certainly, any treatment, even if it holds out but slight hope, is worthy of a thorough trial. It may at least open the way to some new avenue of attack and keep up that needed stimulus so necessary in the pursuit of a problem that has seemed so hopeless.

We recently have brought to a conclusion the treatment of thirteen patients who had schizophrenia. We must acknowledge that our material is limited and does not represent patients who were very favorable for treatment. However, we feel that a review of our experiences may be of value to those interested in this problem.

The Method of Treatment

Descriptions of the insulin-shock treatment have been published in Europe by Sakel,¹⁷ Dusik and Sakel,⁴ Müller,^{13, 14} Braunmühl,³ Hoff,⁶ Larkin,¹⁰ Wilson,²¹ and Schaeffer.¹⁹ In this country adequate accounts of Sakel's methods have been given by Glueck,⁵ Sakel,¹⁸ Reese,¹⁵

*Read before the Society of Neurology and Psychiatry, Rochester, Minnesota, May 29, 1937; also before the Southern Minnesota Medical Association, Winona, Minnesota, August 11, 1937.

Since this paper was presented for publication, thirty-three patients have completed their treatment. Of this group, five made complete recoveries, three were moderately improved and twenty-five showed no improvement. Two of the five patients that recovered have had a recurrence of mental symptoms. One death was attributed to the treatment.

and Wortis.²² We recently made a preliminary report of our work.¹⁶

In our work we have duplicated the original methods of Sakel as nearly as possible, but it

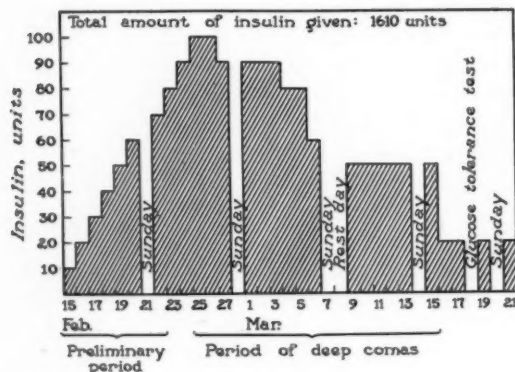


Fig. 1. Dosage of insulin in Case 8.

must be obvious at once that those who apply such a complicated procedure will have to evolve the method of handling numerous details through experience. A prime consideration in the treatment was the selection of patients. For our original group of patients we required that the physical condition of the patient be good. We insisted also that the responsible relatives be aware of the dangers of the treatment and be willing that it be undertaken. The Rochester State Hospital population includes relatively few patients who have schizophrenia of recent onset; consequently our cases have been those in which the psychosis usually extended beyond the critical period of six months.

Our working scheme has permitted us to handle approximately six to ten patients at one time. Breakfast is withheld and at 7 a.m., following the recording of the patient's temperature, pulse rate, respiratory rate and blood pressure, the insulin is injected. The pulse rate, respiratory rate and blood pressure are then recorded at intervals of thirty minutes until the morning's treatment is terminated.

The Dose of Insulin.—Our plan for the dosage of insulin is illustrated (Fig. 1) in Case 8, in which the patient improved during treatment. The treatment begins with the injection of ten units of insulin. This amount is increased daily by ten units until the coma dose is reached. This coma dose is repeated several days and

then, if sensitivity to insulin develops, the dose is gradually lowered as a smaller dose becomes sufficient to produce satisfactory coma. When a sufficient number of comas have been induced, the dose of insulin is lowered to twenty units. This last period of small dosage is our equivalent of "Phase IV" of the treatment as outlined by Sakel.

The Termination of the Morning Treatment.—

The effect of insulin, if not interrupted, would cause coma to persist an indefinite number of hours. It would, undoubtedly, be dangerous to prolong the coma unduly, and the following active measures are taken to terminate the hypoglycemia. At 11 a.m., four hours after the injection of the insulin, patients who have not become comatose are given by mouth 150 gm. of sucrose in chocolate flavored milk. Patients who have become comatose are allowed to remain in coma as long as one and a half hours (if the general condition permits). A nasal tube then is inserted and 150 gm. of sugar in water is allowed to flow into the stomach by gravity. These measures usually cause the patient to awaken within a few minutes.

Sakel expressed the opinion that short severe shocks are to be preferred to long light episodes of coma. Some workers (James, Freudenberg and Cannon⁷) have gone so far as to administer cardiazol in an effort to produce convulsions in addition to coma, in the belief that the convulsive reactions are of aid in bringing about more speedy improvement.

The Phenomena of Insulin Shock

Much has been written of the phenomena which one observes in cases in which schizophrenia is treated by this method. In our cases the first effect of a coma dose of insulin has been to cause drowsiness. This drowsiness in most instances has persisted for about two hours. During the period of drowsiness, pallor and marked perspiration are frequently but by no means constantly present. Following the stage of drowsiness, some patients exhibit a more or less wild motor and psychic excitement, lasting a variable length of time, after which coma appears. Others pass quietly from drowsiness into coma without excitement. It is during the phase of excitement, when it occurs, and during

the early stages of coma that remarkable neurologic phenomena of hypoglycemia occur.

During coma the respirations, the position of the patient in bed and his general condition require constant attention. This, together with frequent observations of the condition of the pulse, respiration, blood pressure and temperature, constitutes the special duties required in the nursing care of these patients (Fig. 2).

The patient in hypoglycemic coma presents a treatment problem which is similar in many respects to the problem of handling a patient during the coma of surgical anesthesia. Both require particular efforts on the part of the attendant to preserve the body heat, to keep the patient warm and dry, and to meet emergencies demanding immediate attention to prevent serious complications.

Subjective Reactions

A visitor observing the insulin treatments may infer from the patient's reactions that he suffers greatly. Powerful muscular contractions, grimacing, grinding of teeth, and extraordinary noises combine to present a picture of unmitigated misery such as accompanies few if any other medical procedures. It is very fortunate that, if this treatment does cause discomfort, the memory of the uncomfortable sensations does not persist. Patients cause no difficulty by refusing or being unwilling to take the treatment, because, they have no recollection of the past treatments and no patient has complained of discomfort. On being questioned, an occasional patient recalls a sensation of intoxication or dizziness as the last thing he remembers before slipping off into coma. One patient has written an excellent description of his sensations during the induction and recovery phases (Case 11). This description is an account of well-known sensations frequently experienced during induction and recovery from general anesthesia.

It is usual for the patient to have a splendid appetite immediately on reacting from the coma and he will usually devour sufficient food at the time of his noon meal so that he will more than make up for the calories missed because of omission of breakfast.

Dangers

Fifteen years of experience in the treatment of diabetes with insulin has proved that the

symptoms of overdosage of insulin are not very dangerous. On the other hand, the degree of overdosage is much greater in the treatment of schizophrenia with insulin and occasionally serious complications may be encountered.

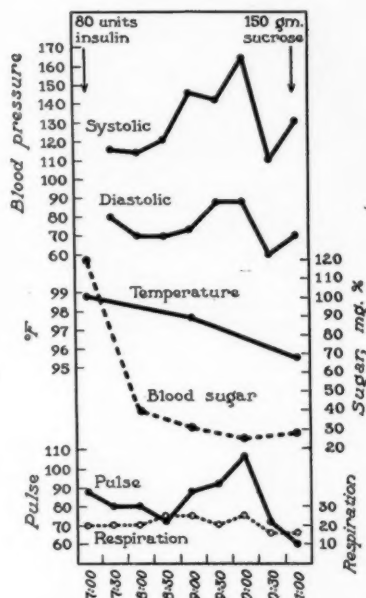


Fig. 2. Usual changes in blood pressure, temperature, blood sugar, pulse and respiration during insulin coma.

The coma initiated by hypoglycemia may persist even after the blood sugar has been restored to a normal level. We have observed two reactions of this type. Two patients failed to awaken promptly from coma after the administration of the usual sucrose by the nasal tube. Both were given dextrose intravenously and more sucrose by nasal tube, which increased the concentration of blood sugar. Coma continued for forty-eight hours in the first instance and then cleared. The second patient remained stuporous four days and Babinski's sign could be elicited on his right foot for thirteen days. In neither case has any evidence of these episodes remained. v. Pap²⁰ has observed similar incidents.

"After-shock" has occurred in five instances in our series of cases. These reactions are likely to occur in a case in which the patient eats poorly at the time of the noon meal. Rather severe hypoglycemic symptoms, even coma, may

INSULIN-HYPOGLYCEMIA IN SCHIZOPHRENIA—ROSENBERG ET AL.

TABLE I. TREATMENT OF SCHIZOPHRENIA (DEMENTIA PRÆCOX) BY INSULIN-HYPOGLYCEMIA

Cases*	Age, Years	Type of Schizophrenia	Duration of Psychosis, Years	Length of stay in Hospital, Months	Prognosis by Usual Treatment	Treatment		Results
						Total Number of days of	Number of Comas	
1	28	Hebephrenic	3	7	Poor	36	20	Unimproved
2	30	Hebephrenic	5	6	Poor	41	24	Unimproved
3	27	Hebephrenic	10	5†	Poor	80	47	‡
4	30	Hebephrenic	2/3	6	Poor	74	38	‡
5	22	Hebephrenic	1 1/2	13	Poor	62	47	Unimproved
6	26	Hebephrenic	1 1/3	5	Poor	64	48	Slightly improved
7	27	Hebephrenic	4 1/2	39	Poor	50	23	Unimproved
8	30	Catatonic	6	6†	Fair	29	17	Marked improvement
9	19	Catatonic	3	5§	Poor	36	21	Unimproved
10	19	Catatonic	3	1 1/4	Poor	41	22	Unimproved
11	22	Catatonic	1/2	2	Fair	31	10	Marked improvement
12	27	Paranoid	1/12	1/2	Poor	40	25	Unimproved
13	34	Catatonic	6 1/2	1/4§	Poor	37	30	Unimproved

*All patients were males.

†Third admission.

‡Some transient improvement.

§Second admission.

appear late in the afternoon. "After-shock" is inconvenient but not dangerous; in cases in which it has occurred the patients have responded promptly to the intravenous administration of glucose. Feeding carbohydrates during the afternoon usually prevents "after-shock." Our routine now includes the administration of 50 to 75 gm. of sucrose in the form of chocolate candy at 3 p.m. and at bedtime to all patients who have received insulin during the morning.

In man, epileptiform attacks occur occasionally during hypoglycemic shock; in dogs, such attacks appear very frequently. These attacks yield promptly to the administration of sugar and epinephrine, and it has been our practice to terminate the hypoglycemic state whenever the attacks become severe. Some writers, as Küppers,⁸ do not interrupt the treatment when convulsive attacks appear. This appears to us to be somewhat hazardous and perhaps unnecessary. Symptoms of circulatory failure have not occurred in our cases and records of the pulse and blood pressure do not show any instances of alarming change during treatment.

Young,²⁸ of Omaha, recently reported one death due to pulmonary edema and one death due to cardiac collapse.

Results

Throughout our work we have adhered to a policy of attempting to make observations as objective as possible. We have made a complete physical, psychiatric and laboratory survey of each patient before treatment was undertaken. We have recorded by photographs and by means of moving pictures the appearance and behavior of each patient before the treatment was begun, as we feel that these data afford valuable evidence in the estimation of any changes which may appear to have occurred as a result of the treatment.

In the thirteen cases which are the basis of this report (Table I), the type of schizophrenia was as follows: hebephrenic in seven cases, catatonic in five cases and paranoid in one case.

Hebephrenic Type.—No improvement was noted in six of the cases in which the schizophrenia was of the hebephrenic type but slight

improvement occurred in one case (Case 6). The outstanding features in this case may be found in the following history.

Case 6.—The patient was a man aged twenty-six years. The psychosis had been present for fifteen months before the insulin-shock therapy was started. He was very untidy; he had a fixed expression, and there was no spontaneous speech. His voice was monotonous, his mood was absolutely indifferent, and he collected all sorts of odds and ends in his pockets, including a match box which he usually kept filled with butter or some other food. He could not be induced to do work of any kind.

At the completion of the treatment he was a little more careful of his dress than he had been. He would read papers and magazines, he would help willingly in the ward work and in the occupational therapy pavilion. His movements remained slow and deliberate and his facial expression remained fixed and staring. The general opinion is that the amount of improvement attained in this case would hardly justify the prolonged, difficult and somewhat dangerous treatment, namely forty-eight deep comas in sixty-four treatment days.

In two other cases (Cases 3 and 4) in which the schizophrenia was of the hebephrenic type the patients experienced transitory changes in their psychoses and for a short time it appeared as though they might improve. At the completion of the treatment, which included forty-seven and thirty-eight deep comas respectively, the patients were unimproved.

Catatonic Type.—The two cases (Cases 8 and 11) in which the schizophrenia was of the catatonic type, the patients improved markedly during the course of the treatment. A summary of the events of these two patients follows:

Case 8.—The patient was a man aged thirty years (Fig. 3). His birth and development had been normal. When he was first admitted to the hospital in August, 1930, psychotic symptoms had been present for one month. He remained in the hospital until June 20, 1931; at that time he was markedly improved and was allowed to return to his home. He was readmitted to the hospital in August of 1934; at this time he was negativistic, sullen and uncommunicative. He improved slowly and was paroled in April of 1935. He returned home and later worked on a farm. He was admitted to the hospital, for the third time, August 27, 1936. For two months he had not shown any interest in his work. A few days before this he had struck his sister and had tried to tear the clothes from his brother. He had stood in one position for long periods. Mental examination at the time of admission was impossible because he failed to answer questions. There was

no spontaneous speech but he exhibited marked *flexibilitas cerea*.

Between August, 1936, and February, 1937, there was no detectable change in his mental condition. At the time the insulin treatment was started it was his habit to sit quietly and apathetically about the ward. At



Fig. 3. Patient in Case 8 (catatonic dementia praecox); a, before treatment; b, after treatment.

times he refused to eat. There was no spontaneous speech and his mental status could not be assessed because he remained mute. The result of general and neurologic examination was negative except that cataplexy was marked.

The insulin treatment was started February 15, 1937 (Fig. 1). On February 18, profuse sweating appeared following the administration of 40 units of insulin. On February 22, 80 units of insulin was administered at 7 a.m. At 11 a.m. a condition of wild motor and psychic excitement was present. The patient made noises, screamed, threw himself around in bed and made powerful forceful thrusts and jumps. After he recovered from the hypoglycemia he spoke freely but was very silly. A half hour later he would no longer respond. Between February 23 and March 6, deep coma was induced daily (except for a rest day on Sundays). On March 6, following the administration of the usual dose of sucrose (150 gm. in 500 c.c. of water) at 11 a.m. he failed to respond and at 1:45 p. m. 25 gm. of a 50 per cent solution of dextrose was administered intravenously. At that time he was in deep coma; salivation and stertorous respirations were present. Ankle clonus and Babinski's signs were present bilaterally. At 2:00 p.m. he had not responded to the intravenous administration of dextrose and 1,000 c.c. of a 20 per cent solution of dextrose was injected slowly into a vein. In addition, 150 gm. of sucrose in water was administered through a nasal tube. At 6:30 p.m. he had not responded to the treatment. His skin was dry and there was urinary incontinence. The value for the blood sugar was 190 mg. per 100 c.c. The pulse rate was 82 beats per minute and there were 24 respirations per minute. The pupils were 2 mm. in diameter and reacted to light. On March 7, his condition continued the same all day. March 8, the stupor had cleared, and the general and

gross neurologic examination did not reveal any abnormality.

Deep comas were induced on March 9, 10, 11, 12, 13 and 15. Beginning on March 9, a remarkable change appeared in his condition. His movement seemed gradually to become more free. *Flexibilitas cerea* dis-



Fig. 4. Patient in Case 11 (catatonic dementia praecox); a, before treatment; b, after treatment.

appeared. The grimacing ceased. He began to speak freely with doctors and attendants. His gait became free and purposeful. He was sent to the occupational therapy pavilion in the afternoons, where he began wood-carving. His speech was silly at times and it occasionally was irrelevant. He did not seem to have much insight into his condition. He did state, however, that he realized he had been "mentally sick." He could describe his former jobs in an upholsterer's shop and in a bowling alley. He spoke freely of his previous earnings and discussed his home conditions intelligently. On March 16, the dose of insulin was decreased to 20 units and this small dosage was continued daily until March 21, after which insulin treatment was discontinued.

On April 26, 1937, he was paroled to the care of his family. He was neat, spontaneous speech was normal and he addressed the physician in an intelligent manner. He smiled and was good humored. He did not have a very good mental grasp of the events of his illness (he thought it might have resulted from smoking, although he had only smoked occasionally, or from drinking, although he had confined his drinking to an occasional glass of wine). He was well oriented as to time, place, and person and his memory for the events of his own life was excellent. His grasp of current events was very poor; he knew nothing of the current Spanish Civil War or of the abdication of the English king. He could calculate accurately and his speech throughout the examination was relevant and logical. He denied hallucinations and no delusions were expressed.

Case 11.—The patient was a man, aged twenty-two years (Fig. 4), who was a senior in a university. The past history was irrelevant. His mother said that he always had been somewhat moody and quiet, but he

had been an average student. The patient was admitted to the Rochester State Hospital on January 27, 1937. During the preceding summer he had seemed unusually preoccupied and very quiet. He had started his senior year at the university in the fall of 1936 and while he had been at home he had spent most of his time studying. About December 1, 1936, his mother had noted that he seemed to be having difficulty in concentrating; he would scowl and keep pressing his forehead with his hand while reading. He had become more peculiar until January 1, 1937, when he had to be removed to a sanitarium because he refused to eat.

On examination prior to treatment he refused to speak and was filthy in his habits. He would protrude his tongue on command and allow the examiner to prick it with a pin, without evidencing any pain. There was marked *flexibilitas cerea* and he had to be fed almost entirely with a tube. He had lost 24 pounds (10.9 kg.). Routine laboratory procedures including serologic tests for syphilis did not reveal any abnormality.

Insulin treatment was started March 17, 1937. One hundred and twenty units of insulin produced satisfactory coma on April 1. He experienced a rather marked "after-shock" about 6 p. m. on April 8.

On April 9 the usual dose of 120 units of insulin produced a deep, satisfactory coma. This coma was terminated at 11 a. m. by feeding with a nasal tube. At 2 p. m. he was talkative but very peculiar. He answered to "how do you feel?" by a long pause and then nodded his head slowly up and down and finally said "pretty good." He talked with the ward attendants about his meal and hummed a song in tune with a nearby radio. At 8 p. m. he refused to answer questions and would not look at the examiner.

The usual morning coma was induced on April 10. At 1 p. m., he was seen washing his face carefully and it was observed that his movements were free, whereas he previously had been very stupid and rigid. When he finished he smiled a greeting and stopped to chat. He was "feeling much better." He knew that he had been ill. He said that he had been unable to eat or talk because a voice told him not to do so.

On April 13, the dosage of insulin was reduced to 20 units daily; sugar was administered two hours later. Two hours after the insulin was injected the patient became comatose and presented a striking instance of insulin sensitization. He was sent to the occupational therapy pavilion on this day and began the caning of a chair. He was amenable, polite, quiet and good-natured. He smiled naturally when speaking and was anxious to please. He described the sensations of the insuline treatment as follows: "One feels before unconsciousness comes, not very sleepy but as though one wanted to move or arise from bed. It took much effort to move my arms, legs or body with much deliberation beforehand. When I moved any part of my body my mental condition changed." Concerning his awakening from the insulin coma he said: "Mentally, I

felt a space separation between myself and the world. Voices and other sounds came to me clearly but they were considered as coming across space, myself being on the opposite side from where voices and sounds came. My head felt as though it were expanding from within, causing mental pain. The sickening headache which resulted would continue for about two seconds, lessen in degree, then in two seconds become more intense, then lessen." When he was paroled on June 4, he was in excellent condition.

In the three remaining cases in which the schizophrenia was of the catatonic type the patients were not improved.

Paranoid Type.—Only one patient who had the paranoid type of schizophrenia was treated. This patient did not show any improvement.

Summary

Thirteen patients who had schizophrenia have been treated by the method of insulin hypoglycemia. Of these patients, ten were unimproved, one was slightly improved and two were markedly improved. The results of our work in the treatment of schizophrenia by the method of insulin hypoglycemia have not been as encouraging as those reported by Sakel. There may be several reasons for this difference. First, the patients were not treated at the most favorable time, and second, we have been cautious about permitting the continuation of convulsive manifestations which are now looked upon as desirable.

Regarding the two patients who improved markedly, the first had improved spontaneously on two previous occasions from similar attacks and there seems to be no way of assuring ourselves that he might not have recovered spontaneously in this instance. It does seem proper to assume that the treatment hastened the recovery. The second patient who improved was a young man who had catatonic schizophrenia; we feel that he would have been given a fair prognosis with the usual methods of treatment. However, there is little doubt that the treatment brought about his speedy improvement. We believe that the insulin-hypoglycemia treatment is a heroic form of therapy and should not be used haphazardly. Our results, while not too encouraging, justify further work in order to evaluate the results of the treatment and possibly point the way to added therapeutic measures. Accordingly, we have recently placed under treatment a

group of twelve female patients who were suffering from schizophrenia.

Undoubtedly, the selection of patients must play an important rôle in determining the usefulness of this type of therapeutic procedure. Rules to be followed in this selection are not apparent from our work. A review of the literature is also unavailing in an attempt to settle this point beyond the fact that the more recent the onset of the psychosis the more favorable is the prognosis.

Uncertainty exists as to how many comas constitute a complete course of treatment. In our work, when improvement has not appeared after the patient has experienced twenty-five to forty satisfactory comas, we have concluded that the treatment is unavailing. Some workers have employed as many as 200 comas without beneficial effect. From our experience we would say that if a patient shows no improvement after forty comas the treatment should be discontinued.

Results obtained by us up to this time suggest that much more work will be required to provide a firm foundation for the extraordinary claims which have been made for this method of treatment.

Insulin treatment of schizophrenia demands of those who attempt it continuous watchfulness and a readiness to act in emergencies, which is based on definite knowledge of the situations at hand. The procedure deals with helpless patients in coma. Violent epileptiform convulsions are an ever-threatening menace. Cardiovascular, respiratory and cerebral calamities have been reported. Other dangers may lurk in regions incompletely explored. Accordingly, this method of treatment should be employed only in hospitals with trained personnel and a physician must always be at hand. The personnel of the insulin treatment ward should be well organized and should be similar to the modern trained operation room force in efficiency and readiness to act. To do less is to expose patients to unjustifiable risks.

We wish to express our appreciation to the Eli Lilly Company for supplying us with insulin for this work.

References

1. Berglas, B., and Susic, Z.: Über die Hypoglykämie-Chockbehandlung der Schizophrenie. *Psychiat.-neurolog. Wchnschr.*, 38:599-602, (Nov. 28) 1936.
2. Berze, Josef: Die Insulin-Chockbehandlung der Schizophrenie. *Wien. med. Wchnschr.*, 83:1365-1369, (Dec. 2) 1933.
3. Braunmühl, A. V.: Die Insulinschockbehandlung der

- Schizophrenie. München. med. Wchnschr., 84:8-11, (Jan. 1) 1937.
4. Dussik, K. T., and Sakel, Manfred: Ergebnisse der Hypoglykämieschockbehandlung der Schizophrenie. Ztschr. f. d. ges. Neurol. u. Psychiat., 155:351-415, 1936.
5. Glueck, Bernard: The hypoglycemic state in the treatment of schizophrenia. Jour. Am. Med. Assn., 107:1029-1031, (Sept. 26) 1936.
6. Hoff, Hans: Hypoglykämie-Schockbehandlung von Psychosen. Wien. klin. Wchnschr., 49:917-918, (July 17) 1936.
7. James, G. W. B., Freudenberg, Rudolph, and Cannon, A. T.: Insulin shock treatment of schizophrenia. Lancet, 1:1101-1103, (May 8) 1937.
8. Küppers, E.: Die Insulinbehandlung der Schizophrenie. Deutsch. med. Wchnschr., 63:377-383, (Mar. 5) 1937.
9. Langenfeldt, G.: Die Insulin-chok-behandlung der Schizophrenie. Psychiat.-neurol. Wchnschr., 38:483-484, (Sept. 19) 1936.
10. Larkin, E. H.: Insulin shock treatment of schizophrenia. Brit. Med. Jour., 1:745-747, (April 10) 1937.
11. Lichter, C., and Lichter, N.: Vol. Jubilaire en l'honneur du Prof. Dr. C. Parhon., 1934, pp. 281-285.
12. Meyer, Adolph: The origin and nature of the hypoglycemic therapy of the psychoses. Jour. Nerv. and Ment. Dis., 85:578-580, (May) 1937.
13. Müller, M.: Die Insulinschocktherapie der Schizophrenie. Schweiz. med. Wchnschr., 66:929-935, (Sept. 26) 1936.
14. Müller, M.: Die Insulinschockbehandlung der Schizophrenie. Nervenarzt., 9:569-580, (Nov.) 1936.
15. Reese, H. H.: Insulin shock therapy of schizophrenia (dementia praecox.) Wisconsin Med. Jour., 36:111, (Feb.) 1937.
16. Rosenberg, E. F., Smith, B. F., Wilder, R. M. and Moersch, F. P.: Treatment of schizophrenia (dementia praecox) by insulin hypoglycemia. Proc. Staff Meet. Mayo Clinic, 12: 273-278, (May 5) 1937.
17. Sakel, M.: Schizophreniebehandlung mittels Insulin Hypoglykämie sowie Hypoglykämischer Schocks. Wien. med. Wchnschr., 84:1211, (Nov. 3) 1934; 1265, (Nov. 17) 1934; 1299, (Nov. 24) 1934; 1326, (Dec. 1) 1934; 1353, (Dec. 8) 1934; 1383, (Dec. 15) 1934; 1401, (Dec. 22) 1934; 85:35, (Jan. 5) 1935; 68, (Jan. 12) 1935; 94, (Jan. 19) 1935; 121, (Jan. 26) 1935; 152, (Feb. 2) 1935; 175, (Feb. 9) 1935.
18. Sakel, Manfred: A new treatment of schizophrenia. Am. Jour. Psychiat., 93:829-841, (Jan.) 1937.
19. Schaeffer, Henri: Le traitement de la schizophrénie par le choc insulinaire. Presse méd., 44:1566-1569, (Oct. 7) 1936.
20. v. Pap, Zoltán: Erfahrungen mit der Insulinschocktherapie bei Schizophrenen. Monatschr. f. Psychiat. u. Neurol., 94: 318-349, (Jan.) 1937.
21. Wilson, Isabel G. H.: A study of hypoglycaemic shock treatment in schizophrenia. His Majesty's Stationary Office, London, 1936, 74 pp.
22. Wortis, Joseph: On response of schizophrenic subjects to hypoglycemic insulin shocks. Jour. Nerv. and Ment. Dis., 84:497-506, (Nov.) 1936.
23. Young, A. G., and Young, R. H.: Unpublished data.

MEDICINE: A CO-OPERATIVE BUSINESS, A NON-COMPETITIVE PROFESSION*

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DR. ALAN DE F. SMITH in a current issue of *Surgery, Gynecology and Obstetrics* writes a short biographic sketch of Dr. Russell A. Hibbs, and I wish to quote from it as follows:

"To those who knew him best his greatness lay even more in his fine spiritual qualities, in his never failing conviction that the truth must always prevail, in his steadfast adherence to any course that he believed was right, and in that rare gift of leadership which inspired all those who served under him to give the best that was in them and to feel that to work with him was a privilege. He always maintained that any accomplishment that was made in the advancement of medicine must come from a deep sympathy of the doctor for his patient and from his real concern in making him well."

What a privilege it must have been for him to be able to express in such beautiful words his honest opinion regarding a colleague and his worth to society. What a satisfaction to have been associated with a man of such fine accomplishments. What an honor to live so that we may leave behind us such sentiments of love to be expressed by those that we have worked and toiled with. That is the result of work well done, purposes accomplished, a life well spent.

Are we each of us devoting ourselves to our fellow men for the good we can accomplish or

purely for selfish reasons? Is the practice of medicine wholly mercenary or purely sentimental? Are we doing our part in the economy of the state and nation, or are we shrugging our shoulders and shifting the burden on the heads of others less able by education or learning to carry it, with the possible regimentation of medicine to the purposes of the State as the penalty for our lack of interest?

Two thousand years ago there was born in Palestine on the banks of the Jordan the greatest Teacher and Physician of all times. He taught the gospel of love and peace to all mankind. He said, "Love your enemies." Men have said His teachings cannot be carried out in this essentially practical and competitive world. Experience, the leveler of all men's thoughts, teaches us that it can and should be as truly practical now as then.

Ambition, the young man's spark plug, gives way gradually to a fuller realization of the need of tolerance in most men's lives in later years. What we need most in America at present is to submerge that mythical ideal of success, the accumulation of wealth, in a development of American standards of just dealing.

If fair dealing for mutual welfare has been found so essential between lawyers, bankers, and business men generally; if friendship is a great and indispensable attribute in business, then

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aren't we, as practitioners of the most sacred calling on earth, remiss if we do not develop a sense of mutual understanding of each others' problems, both economic and professional?

Thoreau once wrote, "If you have built castles in the air, your work need not be lost; that is where they should be. Now put foundations under them."

We are in Minnesota, I believe, putting solid foundations under our professional buildings. Nowhere are higher ideals of practice promulgated than here. We have not builded on the shifting sands. The 2,300 members of our State Association are an essentially learned and highly developed type of men. They have to be. The people among whom they work demand the best in service. We have built their demands up to a high plane. We cannot and will not let down this faith.

The standard of work which we have carried on during the late disagreeable depression among the so-called indigents gives the lie to those who say "medicine" has not done its share to make the lot of the people more tolerable. The long hours of service, the worry of nights of vigil have all been the same even though the incomes of physicians have shown a lessened figure from month to month. We have carried on medicine's unswerving traditions with unfaltering devotion. It is my belief that this "carrying on" through troubled times will be rewarded many fold in the future if we do not lose faith in each other. We are our brother's keeper to no small degree. Elbert Hubbard, that inimitable philosopher, said, "Do not lose faith in humanity. There are over ninety million people in America who have never played you a single nasty trick."

Many of us can remember when Dr. So-and-So would not speak to Dr. So-and-So. When to speak of a man's competitor was to bring down wrath and words of vituperation of unmentionable degree. The Hippocratic Oath was a thing forgotten since the day of graduation. The doctor's family were victims of unjustifiable censure. Small towns were divided into two camps, each with their medical man, much after the custom among ancient tribes of aborigines.

Has this changed today? Have organizations such as we have meeting here changed this attitude to a marked enough degree or are we still in the transitional state?

It is my belief that we have changed, at least

to some degree. The change is not marked enough, but surely is gaining ground toward the ideal, a sincerely united profession.

Statistics show that the number of physicians practicing in states such as ours is just about keeping up with the population; that, while good roads and automobiles have made it easier for men to cover larger territories, new modes of treatment of disease, the intricacies of living and even the good roads and automobiles themselves have added to the work of the man of medicine. Industry and its insurance have entered the picture. Public health measures draw their workers from the graduates in medicine, thus lessening the number available for private practice.

There is work for all who seek it. No one needs to loiter at the door of the temple of Æsculapius. He who searches shall find. The workers are many but the opportunities are three-fold.

The youth who looks through colored glasses, colored by the present trend of economic thought, into the future and sees no opportunity for him will find that the boy with imagination has passed him and has reached the goal of his desires. He is the master, teacher, and leader of the generation.

The success of coöperative enterprises in this State has placed Minnesota at the head of the states of the Union in this type of business; but back of coöperatives are years of solid thought. History but repeats itself and passing time finds but few changes in the economy of the world's wants. The mountains do not move though the winds and hurricanes harass them with their fury. The vast amount of water in the body of the oceans does not change though the waves roll over them.

In 1879 Roswell Dwight Hitchcock wrote "The Socialist" and in it gave us the picture of communism as we know it today. So every profession and business has found, passing down through the ages, that there is strength in numbers, that concentrated thought does the most good for all, that coöperative organizations with strong leadership are successful and easily survive the ravages of time.

Medicine, to keep its place in the fore of professions and protect its members, must foster the spirit of coöperation, must become a solid unit of economic thought, must forget petty jealousies and bickerings between individuals.

MEDICAL TOUR OF SOUTH AMERICA—OLSON

Cicero once said, "Men condemn because they do not understand." To better understand a man is the spirit of better coöperation. Society asks this of the man of medicine. Are we giving it?

While we sit at this meeting we are making resolutions to practice better medicine in the future, to live and forget past differences, to think and speak well of our confreres, to more fully enjoy that abundant life which we hear so much about. Can we and will we carry these same resolutions into effect when we reach our several homes? Why not endeavor to close the gap of unfriendliness between the door of your neighbor's office and your own. If in union there is strength and from fellowship and association come admiration, we can well remember this: "Man's conscious influence, when he is on dress-parade, when he is posing to impress those around him, is wonderfully small. But his unconscious influence—the silent, subtle radiations of his personality, the effect of his words and acts, the trifles he never considers—is tremendous."

From this day forth let our competitor be our coöperator; coöperation, not competition, our motto. An old friend of mine wrote the following after years of sorrow. It made a lasting impression on me. I give it to you:

I've shut the door on yesterday, its sorrows and mistakes,
I've locked within its gloomy walls past failures and heartaches,
And now I throw the key away to seek another room,
And furnish it with hope and smiles and every spring-time bloom.
No thought shall enter this abode that has a hint of pain,
And every malice and distrust shall never therein reign.
I've shut the door on yesterday and thrown the key away,
Tomorrow holds no doubt for me since I have found today.

Tomorrow will hold no doubt for us if we have found each other today and are determined to extol each man's good qualities above his faults.

Let us make of medicine a coöperative business, a non-competitive profession.

MEDICAL TOUR OF SOUTH AMERICA

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UNDER the auspices of the Interstate Post Graduate Association of North America, a party of physicians visited the Universities of South America in the spring of 1937. This association for the past fifteen years has conducted clinical tours to Europe. This is the first visit to South America. There were twenty-six members in our party. The voyage was delightful, the kind one associates with the South Seas. The Neptune party was a new experience to most of us. Continuous pleasant weather banished sea sickness and made weather reports unnecessary.

On the morning of April second we entered the harbor of Rio, the most beautiful in the western hemisphere. As we passed the Sugar Loaf we saw the city spread out along the beautiful beaches. The harbor, twenty-five miles long, offers a beautiful vista as far as the eye can see. Rio is a city in the latitude of the tropic of Capricorn and its climate is similar to

that of Havana. It is the capital of Brazil, a country larger than the United States and abundantly supplied with natural resources. The Amazon Basin, which was once an inland sea, contains rivers, mountains, plains and immense forests.

Many of the hospitals throughout South America are supported by benefit associations whose memberships vary from twenty-five to seventy-five thousand. One Catholic institution in Rio has thirty thousand members. The fee which one pays varies with age. It is approximately one hundred dollars for men and one hundred ten for women. The fee is paid when one joins and entitles the individual to free care for life, hospitalization, physicians, drugs, lawyers, x-rays, burial expenses, grave and grave markings. The reason life care can be given for such a small amount is due to the fact that the institution is endowed. The doctors are not paid.

The old Emergency Hospital at Rio, an efficient institution, has a fleet of ambulances always on call. The doctors are government employees and receive fifty dollars a month for part time and one hundred dollars for full time.

The Beneficencia Portugeza hospital is a beautiful building said to have cost ten thousand dollars per bed. Here we saw Dr. Gudin demonstrate his method of total sterilization. Operating room, dressings, surgical instruments and sponges are sterilized by formalin method. This occurs in a hermetically sealed, air conditioned and air filtered operating room. The amphitheater is above the operating room and one looks down through glass. The operating room is set up and formalin is introduced into the room under a valve control. After a certain time this is neutralized by ammonia and the ammonia neutralized by sulphuric or tartaric acid. Dr. Gudin claims that with care three or four clean operations may be done with one sterilization. At the time of the operation all persons in the room are completely gowned, including the feet. Surgeons are then free to touch anything about the room. If a sponge is dropped on the floor it may be picked up and used within the abdomen without danger of infection. The doctor claimed that by this method wound infection is much less frequent than by the method ordinarily used (Fig. 1).

We visited the Hospital dos Espostos, a hospital for abandoned children. Dr. Jose Martinho da Rocha is the director. Children brought to this hospital are passed through a hole in the wall. Persons leaving the child ring a bell to announce the arrival of the child. Sometimes the name of the child is left, sometimes it is not. The hospital takes care of all children who are left there. At the time of our visit there were seven hundred and fifty children in the institution and two hundred and fifty of them were infants. The children are educated and taught trades in the hospital. There were many cases of lues, tuberculosis and dysentery among the children. Their mortality from syphilis is 30 per cent in babies under one year of age. The diseases most common in children in Brazil are lues, tuberculosis, malaria and worms.

We were invited to a reception at the Brazilian College of Surgeons. Professor Jayme Poggi delivered an address of welcome to the

doctors from North America. Membership in the college is limited to forty and is by invitation only.

At the Deutsches Krankenhaus, Dr. Maurity Santos, who is a very skillful surgeon, did a

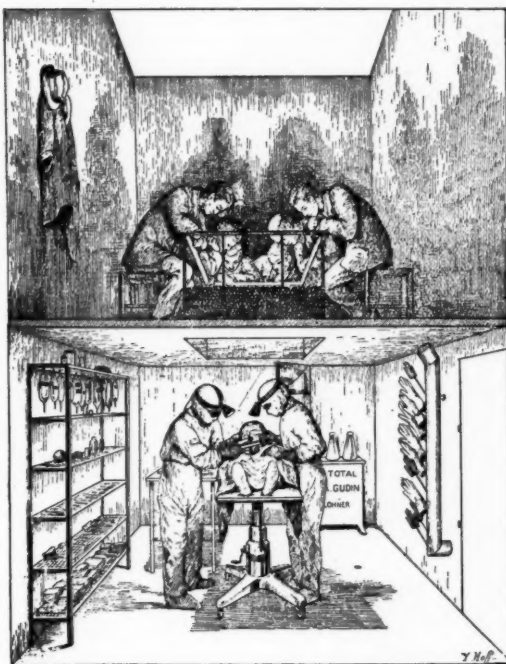


Fig. 1. Gudin's method of total sterilization.

vaginal hysterectomy for cancer of the cervix. No radium is used for cancer of the cervix in this institution. Dr. Santos also did a resection of the rectum for strictures from granuloma inguinale, a very common disease in Brazil. He used his own method, doing a combined abdominal and perineal operation, first liberating the diseased bowel through the abdominal opening, then, by an incision to the side of the rectum, resected the rectum and the diseased bowel, saving the sphincter. The proximal end of the bowel was then pulled through the anal opening and was split for several inches, each half being sutured to the buttock. A small tube was inserted into the bowel and four strips of iodoform gauze were placed into the ischio-rectal fossa. The split portion of the protruding bowel was then allowed to slough. Dr. Santos has operated in fifty such cases. All cases showed a positive Frie's test.

Our medical section made the rounds with Professor Annos Dios in the clinic of Professor Clementino Fraga. He showed a variety of medical diseases, also demonstrated studies of bile chemistry pertaining to acidosis and alkalosis. In this hospital the government maintains a meteorologic station and for twenty years they have studied and correlated the effect of atmospheric changes on disease. Professor Dios concludes that certain atmospheric and meteorologic changes are responsible in part for certain complications such as pulmonary hemorrhages, typhoid hemorrhages, post-operative bleeding and shock as it appears following surgery. When the weather is too hot or the humidity is too great, they avoid operating except in emergency.

On April eighth we went by rail to Sao Paulo traveling through interesting mountainous country. Here and there the valleys were studded with ant hills, some as high as a man's head. Sao Paulo, named after the prophet, is situated on a plateau, has a delightful climate and its people are an energetic populace. The city has doubled in the last six years and now has a population of one million two hundred thousand. It is an industrial city, the "Chicago" of Brazil.

At the Santa Casa hospital Professor Ramos demonstrated cases of lipoid nephrosis showing a transition of this disease into parenchymatous nephritis, also aneurysm of the aorta, with erosion of vertebrae and ribs. He showed cases of Ayerza's disease, claiming that this is not a pathological entity and should not be designated nosographically as a disease. It might well be called black cardiac disease characterized by polycythemia. Dr. Ramos presented cardiac cases well worked up; extensive studies of electrocardiographs in cases of bundle branch block.

The Pro Matre Paulista Hospital is a modern, private maternity hospital of fifty beds, owned by twelve physicians, and has an open staff. They have portable incubators for premature children which are used to bring in cases for hospitalization.

At the Sanitoria Santa Catherina, a private hospital, Professor B. Montenegro did a gastric resection for ulcers of the stomach, using a technic which he developed. The operation was done under spinal anesthesia with one assistant,

one interne and no clean nurse. His technic is used at the University and we saw students doing dog surgery, using his technic, for gastric resections. It is a simplified procedure and enables him to do a resection in one hour. He prefers gastric resection, removing approximately two-thirds of the stomach, in preference to all other operations for both gastric and duodenal ulcers. Dr. Montenegro, who formerly was professor of anatomy, received his surgical training under John B. Deaver in Philadelphia. He has done about twelve hundred gastric resections for ulcers. The mortality in the first 622 cases was 4.5 per cent. He has lowered his mortality in the last series. In his first 500 cases three cases of jejunal ulcers developed; none has developed in the last 700. He thinks this is due to the fact that he now does a more extensive resection. He uses the Van Slyke method of carbon dioxide determination in the blood as an indication for the use of glucose and subcutaneous saline. Glucose is often used pre-operatively but never post-operatively unless there is special indication. Blood transfusions are seldom done.

He thinks that megacolon, megaureters and cardiospasm are all due to deficiency of vitamins B and B¹. Cardiospasm, called "Ecclasia," is very common on the coffee plantations of Brazil. It is not the same as Hirschsprung's disease, which is congenital. Ecclasia is due to paralysis or inability of the various sphincters in the large bowel to open. The spasm of the various sphincters of the colon, including Cannon's sphincter at the hepatic flexure and including spasm of the voluntary sphincter at the rectum, is due to vitamin B deficiency, which is responsible for the lesion in Auerbach's plexus. He believes that the spasm of the internal sphincters could be cured by dilatation if the sphincters could be reached, but there is no way of reaching them except surgically, by doing an open stripping operation, cutting the muscular layer down to the mucosa similar to the Ramstadt operation. He also believes these cases should be treated postoperatively with a general high vitamin diet. We were shown a case of common duct drainage in which the duct contracted under the influence of morphine. Lipiodol was injected into the common duct. When morphine was given, the lipiodol was forced back into

the pancreatic ducts showing that morphine caused contraction of the sphincter of Oddi.

On the afternoon of April eighth we visited the Butantan Institute where Professor Alfrania Amaral, a graduate of the Harvard School of

The department of records has been adopted from the United States. Bi-weekly meetings are held in which all departments exchange information. Practically all papers are published in Portuguese.

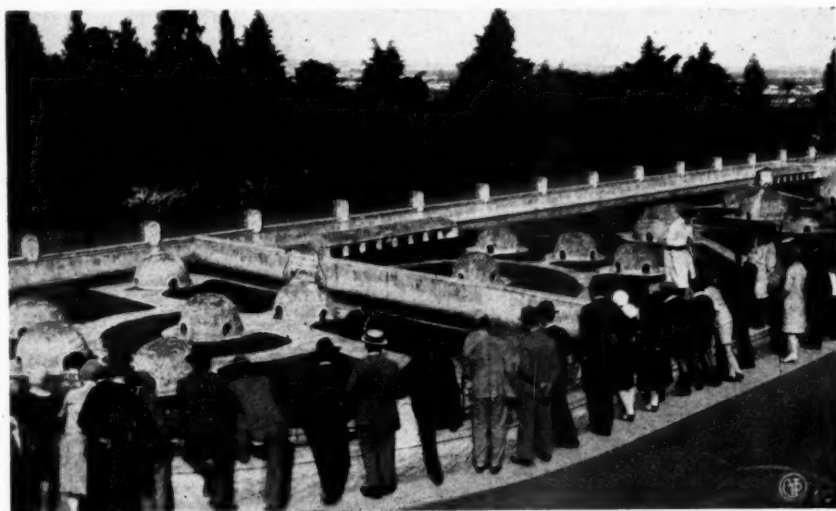


Fig. 2. The Butantan snake farm.

Hygiene in 1924, is director. Fifty years ago this was a private institution for the study of smallpox and plague. It has now been taken over by the state, and it is practically self-supporting. The institution, consisting of many buildings and large grounds, is divided into twelve departments and research is conducted in a variety of scientific problems pertaining to Brazil. Smallpox vaccine is made which can be injected under the skin and does not cause a sore. This was first developed at the Rockefeller Institute. In the department for the study of fertilization, they are trying to develop better fodder, grain, etc. They grow oats from Australia, crossing it with Brazilian oats to improve its yield. A school is also conducted for the children of the employees. They provide a general education for the children and also educate them in special fields of work of the institution with the idea of thereby training future workers for the institute. Professor Amaral stated that it may well be that a child of the laboring man of the institute may become its director. The department of propagandism spreads knowledge of their findings among the people of Brazil.

The Butantan snake farm (Fig. 2) comes under the department of biology. There are three types of poisonous snakes: rattlers, vipers and cobras. The rattlers and vipers are found in Brazil. Three types of antivenom are made: one for the rattler family, one for the viper and one that is polyvalent. When not certain of the reptile the polyvalent serum is used until the symptoms show which type is indicated. An injection should be given every two to three hours until the patient shows definite symptoms of recovery. One of the striking symptoms is blindness; another ptosis of the upper eyelid. As the toxins are neutralized these symptoms improve.

Professor Amaral has succeeded in crystallizing the toxin but so far has been unable to synthesize it. He knows that it contains carbon, hydrogen, oxygen and zinc. The poison is very complex in structure. In one species of snake Professor Amaral claims to have isolated twelve different poisons, each having an affinity for certain structures of the body. One affects the cardiac muscles, one causes lysis of the white blood cells, one of the red blood cells, another

causes smooth muscle poisoning, one paralysis of the phrenic nerve, one affects the brain and nervous system and one coagulates the blood, et cetera. This coagulation factor is used in the treatment of purpuric diseases. The snakes are obtained from ranches in the interior in exchange for antivenom. The snakes will not eat while in captivity and die in one or two months. More snakes are received at the institute than can be used.

The use of alcohol is not helpful but is injurious in treatment of snake bites as it reduces the resistance of the victim. The bite of a venomous snake seldom causes bleeding because it is a deep puncture of the fangs and the venom coagulates the blood. Non-poisonous snake bites cause bleeding because these snakes have many teeth and they tear the tissues. The black snake is immune to snake bites and will destroy the poisonous snake if in the same enclosure. A poisonous snake will not attack people but non-poisonous snakes do.

The venom is comparable to the parotid secretion of man, it is proteolytic for the carnivorous food of the snake and for the tissues of man. The dose of the antivenom is inversely proportionate to the weight of the patient. Smaller individuals receive the larger doses. Success also depends on the time factor, the earlier the antivenom is given the better. The laity can administer the serum. Only 30 per cent of persons bitten need antiserum but there is no way of selecting this group. The mortality has been lowered from 20 to 2 per cent by treatment. It is very difficult to immunize against snake bites, for it takes three months to produce an immunity which lasts only a few weeks.

The guinea pig is very susceptible to snake poison. A guinea pig is now being crossed with a native pig called "Kova" which is resistant to venom. It is found that the hybrid animal produced by this crossing develops skull changes resembling the "Kova." Dr. Amaral said this indicates that immunity laws apparently follow the Mendelian laws of heredity. He does not recommend the use of South American serum in other countries because of the necessity of strict specificity.

In Brazil the Japanese inhabitants eat snakes as a delicacy. Professor Amaral is doing some research work upon a worm infestation which

occurs in Brazil. These worms occur in rodents eaten by snakes and the snakes are eaten by the Japanese. He believes this worm will be found in the Japanese immigrants.

They also have several species of large poisonous toads from which they have extracted a toxin that resembles digitalis in action. The parotid gland secretion of toads is alkaline and its alkaloid is Buffotoxin.

The institute is doing research on the coffee bean. Professor Amaral has demonstrated that the harmful effect of coffee is not that of caffeine but another alkaloid which is not yet isolated.

They are conducting research in virus diseases and other infections, such as Rocky Mountain fever and typhus in relation to Brazil.

In the laboratory of Endocrinology, Professor Amaral demonstrated two rats, a male and a female, whose peritoneal cavities had been anastomosed. The male had been castrated. The experiment showed that the excess of pituitary hormone from the castrated male was causing an enlargement of the uterus and adnexa in the female. The uterus occupied both peritoneal cavities. In the eye of the female they had transplanted a piece of the ovary and were able to see with an ordinary magnifying glass this ovary form follicles in the cavity of the eye. He showed a second animal in which the tuber cinereum had been destroyed by cauterization. This animal showed a profuse growth of incisor teeth which had become so long they had the appearance of tusks curled upon themselves. This demonstrated the factor of growth from the tuber cinereum which may be related to the growth factors of the body in general.

In the laboratories we also saw models of phagedenic ulcers which had been cured by the application of plain horse serum, dried and powdered, which is very stimulating for tissue growth. This dried serum may be used in varicose ulcers.

Professor Dr. Joao de Aguiar Pupo, Dean and Professor of Syphilology and Dermatology, showed us through the medical center of Sao Paulo. It is a new building financed by a \$2,000,000 grant from the Rockefeller Foundation matched by the State of Sao Paulo. Its teaching facilities are modern in every way. No medical school could ask for finer equipment or better facilities for study. The departments

of Embryology and Physiology are very complete, having models, drawings and actual specimens projected and artificially lighted. A lecture room designed by Professor Edmundo Vasconcelos was the last word in equipment. The entire room was artificially lighted. There were illuminated glass boards which could be used in a dark room. The projecting apparatus was controlled from the operating table and the seats were individually lighted.

The medical course at the University is six years and the requirements for entry are two years pre-medical and competitive examination. Three hundred and fifty apply; only seventy are accepted. Students pay no tuition. Only graduates of this University are admitted to practice. Foreign doctors must take the last three years at the school and also must take the examination in Portuguese. Only naturalized citizens may take the examination.

We traveled by cable railroad to Santos, a town of about fifty thousand and the seaport of Sao Paulo. It was formerly called the white man's graveyard due to ravages of yellow fever and typhus. Modern sanitation has changed all this. A paved road has just been completed connecting Santos with Sao Paulo. Ninety per cent of the world's coffee is transported over the cable railway from Sao Paulo to Santos. This is considered the most remarkable railroad in the world. Trains are taken up and down by counterbalanced cables, three cars up and three down every seven minutes. The construction of this road is a great engineering feat, not only on account of the steep incline but because of the annual rainfall of one hundred and eighty inches which necessitates elaborate watercourses to prevent washouts.

The Orchid Park at Santos has four thousand of the forty thousand varieties of orchids found in Brazil. There were rare varieties of orchids most strange and beautiful.

At Montevideo, the capital of Uruguay, we were received by Dr. J. A. Whitelaw at the Department of Health. He explained their public health set-up, which is most advanced. They have public health stations in all parts of the country where laboratory work and serology examinations are at the disposal of practicing physicians. Tuberculosis and syphilis are under complete control. Formerly 25 per cent of the

population were luetic. Since control measures were adopted this has been much reduced. The cost of the program has been defrayed by a one per cent land tax.

The medical societies of Uruguay are organized in a federation of medico-scientific societies. Twenty-three medical journals are sent to all its branches for dissemination of medical literature, of which twenty-one are from the United States. Its own reports and transactions are sent to thirty-five medical institutions in the United States.

The incidence of echinococcus is high. As one doctor expressed it, "A man who comes from the country, wears high boots and has a large liver, may be safely diagnosed hydatid cyst." In treatment of echinococcus cysts of the lung the choice is for a two-stage operation. Daughter cysts occur in the liver but not in the lung. At the Pasteur hospital Professor Alfredo Navarro performed a one-stage operation on echinococcus.

Professor P. Lasnier, at the school of medicine, was experimenting with the possibility of diagnosing carcinoma of the lung from cells found in the sputum. At the University School of Medicine several clinical presentations and papers were given. One advocated the use of folliculin ointment for acne vulgaris and for hypertrichosis with a report of ten cases treated effectively by folliculin ointment 25,000 to 50,000 units.

Cases were demonstrated showing a coincidence of hyperthyroidism with hypopituitarism in undergrowth with delayed ossification, slow dentition, mental retardation and delayed speaking. They discussed the relation of thyroid to ossification while Americans who follow Engelbach believe that the thyroid is responsible. A case shown was a patient with hypothyroidism who received large doses of thyroid and showed premature ossification. This case throws much weight in favor of the American viewpoint.

On the evening of April eighteenth we boarded a river steamer for Buenos Aires, a city of two million people located on the Plate river. The Plate river is forty miles wide at its mouth. The harbor at Buenos Aires is not deep enough to accommodate the largest ocean-going vessels. Buenos Aires is a busy place which has caught the modern trend. Nowhere else have I seen so

many wide boulevards being cut through the business section. When these are completed they will rival the Boulevards of Paris. They have three subway systems. Buenos Aires, as a city, has favorable health conditions. There is no dysentery or malaria. They have one medical center and ten general hospitals, all assisted by the government. We were welcomed by Dr. R. Castex and his associates. Professor Castex in general chairman, holds the chair of internal medicine and is in charge of clinics for all of South America.

We were treated to an array of medical clinics. There were twenty-six papers and demonstrations covering a variety of medical subjects. There was a demonstration of cisternal puncture and encephalography; paper by Dr. Dowling on tumors of the central nervous system; paper by Lanari on the dangers of thorium oxide medication for diagnosis of liver disease; demonstration (Jacobeus's method) of pleural blebs which comes with acute idiopathic pneumothorax; cataract removal by pneumatic forceps; a case of progeria, premature senility with senile type of loss of teeth in a congenital syphilitic boy; bronchographic demonstration of cancer of the lung; lung puncture for diagnostic removal of tissue cells; and a case of obesity whose underlying condition was due to suboxidation due to faulty breathing with improvement from breathing exercises. In a discussion of black cardiacs, x-ray demonstration of bronchial changes in black cardiacs showed they do not suffer from a lack of oxygen in the blood. There is polycythemia and they are worse in the winter. The chief pathological finding is a chronic bronchitis with emphysema. X-ray gives the appearance of: (1) winter tree; (2) spring tree; (3) summer tree, according to the stage of the disease.

Dr. Pollitzer demonstrated his "Diagraphia" which visualizes in the x-ray film respiratory excursion in normal and abnormal lungs, heart, mediastinum and diaphragm. These films were put into a machine which gave them the appearance of a normal expansion and contraction of these organs. Dr. Pollitzer was able to show some lung cavities which contracted and others that expanded while still others showed no change. Its scientific value is not determined.

The intra-arterial injection of acetylcholine for therapeutic uses was demonstrated.

The recommended treatment of intermittent claudication and thrombo-angiitis obliterans is the subcutaneous injection daily of 250 to 750 c.c. of oxygen 95% plus carbon dioxide 5%, twenty days in succession. The injection requires ten to fifteen minutes, under moderate pressure. It is not painful and the gas is absorbed completely in twelve to sixty hours. Body movement facilitates absorption. A patient who could walk one or two blocks now walks sixty blocks without claudication.

We were shown the use of a single large dose of sodium salicylate in acute rheumatic fever when a liter containing 23.5 grams was administered per rectum, 40 drops per minute by Murphy drip.

A lecture on parasitology in Argentina was given by Dr. Greenway. Fifty per cent of digestive disturbances in Buenos Aires is due to *tenia saginata* which travels from cow to man to cow. Raw meat is the medium. Hookworm and trichinosis are common.

We were shown the use of paper x-ray films for diagnosis of tuberculosis in a general population. Demonstration was given of a method for taking a large number of x-rays in rapid succession. This apparatus can be taken from place to place and chest plates of large groups of people taken in a very short time. In one year 80,000 x-rays of the general population were taken by this method. Thirteen thousand showed tuberculosis, 71 per cent with lesions, and 61 per cent of the 71 per cent with cavitation.

Our medical group visited the municipal hospital, Hospital Muniz. It is a large hospital equipped to segregate contagious diseases. The tuberculosis building is new and beautiful. There is a new department of pathology in which research on leprosy is to be carried on. The chief prepared slides of leprosy bacilli. Diagnostic points on leprosy are: anesthesia to pin prick, falling of eyebrows, alopecia, mask face, bulbous nose and face, pocked skin, etc. In the wards we saw medium and advanced cases, varying from lesions which consisted of atrophy of the subcutaneous tissue to peripheral neuritis to diffuse skin lesions with ulceration and destruction of extremities.

Dr. Biassoti, assistant to Professor Houssey, is a co-discoverer of the importance of the pituitary in diabetes. His experiments on hypophysectomized dogs led to the knowledge that the anterior lobe of the hypophysis is the source of many hormones, among which are those that control carbohydrates, protein and fat metabolism, as well as those that govern growth, gonads, secondary sex characters, et cetera. Biassoti holds that insulin is glycolytic and thyroxin proteolytic.

Biassoti and his colleagues have produced histine insulin to replace protamine insulin. His curves show that its effects are completely comparable to protamine insulin. Chemically it is crystalline insulin plus histine.

Professor Houssey after conducting us through his laboratory gave us a lecture on the hypophysis. Though a very modest individual, he is one of the outstanding men in medicine today. His laboratories are well organized and he is making real progress in his field of research. He has added such to our knowledge of the pituitary gland. He showed us pictures and graphs showing the effect of pituitary on experimental animals. Many of his experiments on the pituitary are carried out in frogs. He stated, "It is easier to operate upon the pituitary in the frog as it can be reached through the mouth and besides the reactions that occur seem to be exaggerated, making it easier to study."

Some of our members visited the clinic of Dr. Gutierrez. He is chief surgeon at the Spanish hospital, an institute supported by a benefit society of 70,000 members, each paying two pesos and up per month. They have free beds, second class and first class rooms. The first class pay ten pesos a day, have a private bath and a bed for relatives in the same room.

Dr. Gutierrez demonstrated the use of epidural anesthesia. He has used this anesthesia in 3,400 cases without a fatality. It is injected into the epidural space, 40 c.c. of a 2 per cent solution of novocaine. This anesthesia is based on the physiologic fact that the epidural space has a negative manometric pressure. This space can hold as much as 200 c.c. of fluid. The dura being attached to the foramen magnum prevents the anesthetic from reaching the brain. The anesthesia extends from the clavicle to the feet,

lasts from one and one-half to three hours. The method was first presented by Dr. Pages, a Spaniard, in 1921. He reported forty-one cases. Soon after, he was killed in an automobile accident. In 1931 an Italian surgeon claimed the invention. When Dr. Gutierrez published his report he gave credit to Dr. Pages. Dr. Pages used a 1 per cent solution, which is not strong enough. One must use 2 per cent. Dr. Gutierrez uses it in selected cases, preferably when blood pressure is high. It is a good anesthetic. There is no drop in blood pressure, no headache and no vomiting; it also lasts longer and is safer than the subdural. It requires skill in administration. The needle is introduced slowly; a drop of water is placed in the head of the needle. When the epidural space is entered the negative pressure disturbs the drop. One can also test by trying to inject the anesthetic. If one meets resistance the needle is not in the proper place. When the epidural space is entered the fluid can be injected without any resistance. If one enters the subdural space the needle is withdrawn and the next interspace is tried. Dr. Gutierrez usually injects in the first or second lumbar space. For the new beginner he recommends a small manometer attached to the needle, as this makes it easier to find the space. At first 5 c.c. are injected, then after a five-minute interval, 10 c.c. are injected followed by 20 c.c. a few minutes later. This gives enough anesthesia for a breast amputation or resection of the stomach. Hernia can be done with 25 to 30 c.c.

Dr. Gutierrez has also devised an operation for nephropexy. Most floating kidneys occur on the right side. He stated that the kidney has a space of its own and when this space is deformed you have ptosis. It is possible to demonstrate this space by liberating the hepatic flexure of the colon and turning it toward the midline. The kidney is then shoved back into position. A transverse incision into this space just below the kidney is made. The upper edge of this incision is stitched to the psoas muscle with three or four silk sutures, thus reducing the space to normal size. In ptosis of the kidney the hepatic flexure is usually too low on the colon so he selects a point higher up on the colon, fastening this new flexure by silk sutures through the white band of the colon to the

parietal wall. This is a successful operation. He operated on one case for us and showed us x-rays of several successful cases taken years after the operation showing the kidney in normal position.

Dr. Gutierrez also devised an operation for difficult inguinal herniae where he transplants the sartorius muscle under the cord and attaches it to the rectus muscle. The muscle is cut through a separate incision at the middle of the thigh, taking care to preserve the nerve and blood supply, bringing it under the cord and fastening it to the external oblique. Two incisions are necessary.

He used Delbet's plaster splints for fractured ankles. They consist of two strips of plaster, one on each side, from below the knee to the sole of the foot, then a figure-of-8 plaster from the lower end of the lateral splints up and crossing the back of the ankle just above the tendo Achillis, then forward over the front of the leg a circular plaster unites the upper ends of the splints. This allows free use of the ankle joint and is a good ambulatory splint.

The BCG is used quite extensively in Buenos Aires as a prophylactic against tuberculosis. American doctors are afraid of this vaccine. It is used extensively in France; about 600 packages are sent out daily from the Pasteur Institute. It is given in milk by mouth at birth.

On April twentieth we visited the Institute of the Benevolent Society of the capital. Professor Ramos did a cesarean section on a patient with contracted pelvis. The patient, a primipara, had been in labor two days. Ether anesthesia was used. The patient was placed in a unique position, the legs being spread and held over stirrups. This allowed the second assistant to stand between the legs. Professor Ramos has good technic. He sutured the peritoneum to the skin before opening the uterus. Dry towels were used within the abdomen. A transverse low incision was made through the visceral peritoneum of the uterus which was reflected up, then a midline incision of the muscle was made. After delivering the fetus with forceps, he injected pituitrin intravenously and allowed the placenta to deliver spontaneously, which it did in ten minutes without much bleeding. The suture line in the wall

of the uterus was covered by the reflected peritoneum.

Professor Ramos also operated on a case of multiple fibroids in a young woman twenty-six years of age. She had many large fibroids and several small ones. The uterus was split in the midline and half a dozen fibroids the size of one's fist were enucleated. The uterus was reconstructed using the Reverdin needle. He said she would be able to bear children after this procedure.

There were clinics at the University of La Platte, which is a one hour ride from Buenos Aires. Of special interest was the museum of La Platte. There one finds the most complete collection of early Indian relics found anywhere. They have an enormous fossil collection containing the largest dinosaur skeleton ever discovered.

The hospital, Sanatorio de Llanura e Vincente Lopez y Planes, is located forty miles from Buenos Aires. After a visit to this wonderful institution we were impressed with the prevalence of tuberculosis in South America. The hospital has eight hundred beds and a waiting list of five thousand. Dr. Florencio E. Boneo and staff showed us through the hospital. It is a clean, orderly, efficient institution. Eighteen cases of extrapleural thoracoplasty were lined up before us, all showing splendid results. They showed us fine x-ray studies, a splendid hall of pathologic specimens, long wards of fifty to sixty beds with overhead canopies and spotless white linens. We noted the perfect coiffures of the girls in the beds, their bright eyes, sun-burnt complexions and pleasing faces. All of these features together with perfect military discipline made this a model tuberculosis sanatorium. The discipline was perfect, with certain hours relegated to rest, exercise, diet, hygiene, etc. This place is a great credit to Buenos Aires and Argentina. Dr. Boneo demonstrated his own saddle chair for thoracoplasty (Fig. 3).

Our receptions at the American Embassy at Montevideo and at Buenos Aires were particularly pleasant. At Buenos Aires the Embassy overlooks the park system. The buildings, grounds and view makes the White House at Washington look cheap by comparison. The Embassy, formerly the home of a private citizen of Buenos Aires, is owned by the United

States Government. It cost the government one and one-half million dollars.

On April twenty-third we left Buenos Aires by train and arrived at Mendoza, the grape center of South America, the next morning. The trip over the Pampas was most interesting. It is a flat country with grass knee-high and cattle everywhere. No other country can produce cattle with so little effort as Argentina with thousands of miles of good pasture, wide open ranges and plenty of water. The owner has to see his animals only twice, once when the calves have their ears clipped for identification and again when they go to market.

The trip across the Andes is one never to be forgotten. The Christ Monument is in a pass about 13,000 feet high and the descent on the West slope is very steep. I counted one hundred thirty-two hairpin turns from the monument to the river below. Some of our party felt the effect of the altitude and we were all glad to get down. It is a very dangerous trip. We traveled by automobile on a one way road, starting at 5:00 A. M. and reaching Santiago at 10:00 P. M., a long, hard, interesting journey.

Santiago is a beautiful city situated in a valley at the foot of the Andes. The medical work is of high grade. Buildings and operating rooms are antiquated. Coal stoves were used for heat while ether was being administered nearby. At the Institute of Cancer we saw exceptionally high-class work by Dr. Leonard Guzman. They have one and one-half grams of radium and use it to the exclusion of surgery in carcinoma of the cervix. His cures run from 25 per cent to 65 per cent according to the degree of involvement. They follow the French school and apply small doses over a long period of time, rather than massive doses for short time as is the usual practice in the United States. Ten or fifteen milligrams are left in the uterus for as long as three weeks, being taken out every other day, cleansed and re-applied. Dr. Mardonez is director of the medical school, which was established one hundred years ago.

We went by train to Valparaiso, the seaport of Santiago. It was formerly the largest city of Chile but now Santiago is twice the size of Valparaiso. The medical work of Valparaiso is of high character in spite of dilapidated build-

ings and poor equipment. As Dr. Munich expressed it, "We have stopped apologizing for the looks of the buildings and call attention only to our work. After seeing the old amphytheater in Vienna where Billroth and Von Eiselsberg did



Fig. 3. Saddle chair for thoracoplasty designed by Dr. Florencio E. Boneo.

such brilliant work we have decided that it is not the buildings that are important."

Dr. Munich and staff had a full morning of surgical cases, including cervical rib, diverticulum of esophagus, acute hemorrhagic pancreatitis, goiter, thoracoplasty and gastroenterostomy for hourglass stomach due to stricture. Teratoma of the testicles in which a positive Aschheim-Zondek test proved the diagnosis.

The prevalence of lues can be judged by the statement of Dr. Reed, who said, "With every clinic of ten patients there are eleven cases of syphilis, if you include the professor."

Dr. Marrianna's test for Addison's disease is based on the fact that morphine plus glucose alters the blood sugar curves. In Addison's after morphine, the blood sugar falls; in normal cases the blood sugar rises.

The San Agustin and Vina del Mar Hospitals

were erected sixty-four years after Columbus discovered America. Acute infectious hepatitis is a very common disease in Chile. They had fifty cases at the hospital this spring. Twelve per cent of all admissions are affected with this disease, the cause of which is unknown, but may be a spirillum. Asthma is treated by intravenous injections of 20 per cent 90 proof alcohol in glucose water solution, first dose of 5 c.c. being later increased to 10 or 20 c.c.

After a delightful banquet given by the medical profession and city of Valparaiso, we boarded the Grace line, Santa Clara, and sailed up the west coast of South America. The captain said he was always glad to leave the harbor of Valparaiso on account of his fear of earthquakes. The voyage up the west coast was the most interesting of our journey.

The west coast is influenced by the Humboldt current as much as England and the Scandinavian countries are influenced by the gulf stream except that the Humboldt current is cold, coming from the Antartics, while the gulf stream is warm, coming from the Equator. The Humboldt current strikes the west coast of Brazil south of Valparaiso and follows the coast up as far as the middle of Peru where it turns toward Hawaii and is joined by the Japanese current. This cold current causes the moisture from the trade winds to fall several hundred miles out to sea, and on the coast of Chile and Peru they only have rains about three times a century. This happens only when the current for some reason changes its course. On account of the Humboldt current the west coast is dry and cool in spite of the blazing tropical sun. The average temperature of Lima, Peru, is from 65 to 75 degrees the year around.

The bird life along this coast is most interesting. There were millions of guana birds resting on the water, and the sea was alive with fish which came to the surface so that one could see their fins churning the water. Thousands of birds feeding upon these fish would drop like spears into the water. We also sailed among many schools of seal and porpoise.

At Lima we saw ruins of the old ancient Aztec civilization. Their capital city is Cuzco, located on a plateau in the Andes.

On May eighth we visited Guayaquil, a city without rain. It is the principal center for panama hats, which, contrary to the popular belief, come from Ecuador. We were courteously received by the President of the University and several members of the faculty. The buildings are quite antiquated and evidence of their economic limitations is visible on all sides. We were driven to the city hospital, which is also the University hospital. There were more than one hundred patients and visitors at the entrance waiting admittance to the out-patient department. They filled the entrance corridor. The hospital wards contained about fifty to sixty beds. I asked one of the doctors what kind of diseases they treated. He promptly replied, "Syphilis." We learned that they also had cases of bubonic plague and a few cases of yellow fever at the time of our visit. A doctor from the United States Health Service had just been there to make the diagnosis. Some of our doctors were shown bacillus pestis out of a fresh case.

From Guayaquil we sailed to Panama city. As we passed through the canal this interesting project was explained to us by a professional lecturer furnished by the Grace Line. Colon on the Atlantic side is a free port and enormous cargoes from all parts of the world were being transferred there. We spent one day in Havana and then journeyed back to New York.

The South American trip was very interesting and well worth the time and money spent.

* * *

In addition to the doctors mentioned, hosts of other distinguished physicians gave us clinics and demonstrations, for which we are grateful. We were received by the public officials of all countries visited and we appreciate this honor.

I am indebted to the members of the party for the use of their notes, particularly to Dr. J. H. Barach, who consolidated them.

CONGENITAL MEGACOLON TREATED BY DAILY HOT IRRIGATIONS OF NORMAL SALINE SOLUTION AT 115 DEGREES*

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ACCORDING to Ruhrah,¹⁶ Billard in 1820 described a case of congenital megacolon and called it sclerosis of the colon; Parry reported a case in an adult in 1825; Hirschsprung gave this malady the name megacolon in 1880 and published his classical description in 1888. Since then many cases and summaries of reported cases have been published. The summary by Judd and Thompson¹⁰ in 1928 includes sixty-five reported cases.

According to Rankin, Borgen and Buie,¹⁵ Hirschsprung defined the disease as "congenital, high grade dilatation of the colon with thickening of all its tunics, especially the tunica muscularis, and retention of large quantities of fecal matter." To date this definition is accepted as it was when it was first published.

Rankin, Borgen and Buie¹⁵ list twenty-two hypotheses concerning the etiology of megacolon. They reduce these hypotheses to a summary under three headings, namely: congenital defects, obstructive processes (due to either anatomic conditions or to disturbances in the nervous mechanisms), and infectious processes. In most cases the pathogenesis is mixed with the several etiologic factors often combining to produce the condition of megacolon.

In the realm of treatment many recommendations are made by various authors. The most successful form to date is sympathectomy, first reported by Wade and Royle¹⁸ in 1927. However, in this paper a suggestion is made for treatment employing mechanical and thermal stimuli in a simple form. Although this form of treatment is slow in achieving its results, yet because it carries none of the risks and complications of a sympathectomy, it deserves further study and trial.

The following three cases were so treated with good results.

Case Reports

Case 1.—R. F.,* male, three and a half years old, was diagnosed congenital megacolon when but five months old. He had medical care at various times, dietary regime, and hospitalization, but up to the time of this last admission he had little or no relief.

On admission to the University Hospital on May 16, 1931, his constipation was quite marked, more so than at any previous time. At irregular intervals he had attacks of nausea and vomiting, accompanied by marked abdominal distention. He was rather pale and weak. His abdomen protruded and was unusually large. It measured 64 cm. in circumference. His weight was 14,500 gm. The physical examination was essentially negative except for his very large abdomen. The urine was normal. The blood showed an anemia: hgb. 55 per cent, r.b.c. 3,800,000. The differential was normal. The blood calcium was normal. The Wassermann was negative. During the first three weeks he was given an abundant diet, also iron and cod-liver oil, enemas and purgatives and blood transfusions, but there was no improvement.

At the time this form of treatment was instituted, this boy was actually failing. He was pale and weak and could not sit up to take nourishment. Even though he was fed he could not take much nourishment and he had emesis frequently.

Sympathectomy was considered during the first three weeks, but as the patient's condition was becoming more and more serious this could not be done. On June 9, treatment consisting of a hot daily colon irrigation through a specially designed rectal instrument (Fig. 1) permitting a controlled inflow and outflow, was instituted. Normal saline solution was used at 115° F. The treatment lasted from thirty to ninety minutes at first, depending upon the response of the patient. It never lasted less than twenty minutes, but it lasted longer if necessary, until the saline returned clear repeatedly. Several gallons of solution were used at one time. The solution was prepared at the bedside by dissolving the required amount of salt in a gallon of hot water. These irrigations were given slowly in order to avoid distention. In a few days this patient showed signs of recovery and improvement. His listlessness became less marked, he started to take an interest in things about him, and to take food. In ten days he

*A report of this case was presented to the American Academy of Pediatrics at its annual meeting in Minneapolis in October, 1934 (Jour. Pediatrics, 5:733, 1935).

*From the Department of Pediatrics, University of Minnesota.

started to sit up and later to stand up. On August 17 he was allowed to be up and around.

The following excerpts from the x-ray reports by Dr. L. Rigler indicate the improvement in the condition and size of the colon.

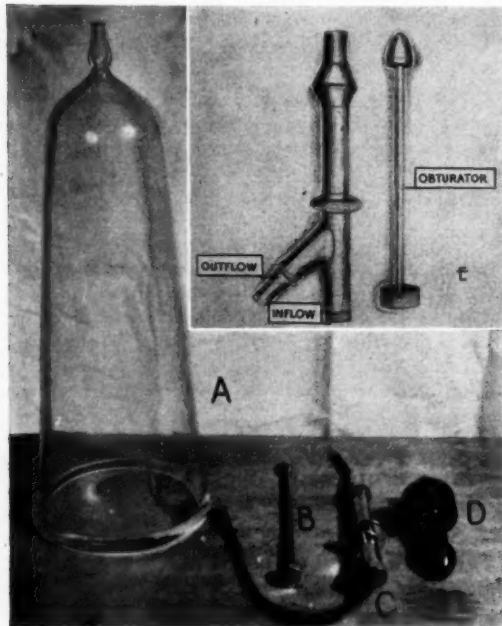


Fig. 1. Apparatus including (A) two gallon flask; (B) longer irrigator; (C) catheter, large size; (D) Austin irrigator, small size; (E) rectal irrigator.

May 22, 1931 (before treatment) . . . "Enormous colon. On account of the marked distention, only the rectum and part of the sigmoid were filled with 1,500 c.c. of barium sulfate. Conclusion—congenital megacolon." (Fig. 2.)

September 25, 1931 (after four months' treatment) . . . "Marked diminution in size. Caliber is two-thirds to one-half of what it was previously, peristalsis well demonstrated and much more marked than normal. Conclusion—megacolon diminishing." (Fig. 3.)

November 4, 1931. . . "Further decrease in the size of the colon." (Fig. 4.)

This patient was discharged on December 9, 1931, his mother being instructed how to continue the irrigations at home if needed. The mother continued to give him irrigations at irregular intervals for eight months. On June 29, 1937, this boy was fine, had no more treatments and was having normal stools. He was as normal and as active as other boys nine years old, but his abdomen was still larger than the normal.

Certain observations were made on this first case and checked several times. After but a few minutes of treatment, marked evidence of peri-

staltic activity was frequently noticeable through the abdominal wall. These waves were very well shown by motion pictures (Fig. 5). To the palpating hand at such times the sensation was similar to that of the contracting uterus during a pain. We noticed at the same time that the outflow had ceased and yet frequently the outflow tube pulsed or jerked. This suggested that possibly the rectum in this case contracted in a region somewhat higher than the sphincter. To the palpating finger this was rather vague, though we were inclined to interpret the muscle rigidity that was felt high up in the rectum as probably capable of preventing an outflow with the outflow tube pulsating. We, therefore, made up a longer irrigator (Fig. 1) and with its use the outflow was better.

Case 2.—Anthony W., male, aged five, was recognized as having congenital megacolon in early infancy, and was admitted to the Minneapolis General Hospital three times. His first admission was on March 21, 1933, when he was fourteen months old. X-ray on March 23rd corroborated the diagnosis of megacolon. He had marked constipation and abdominal distention. The bowels did not move without enemas and he had frequent attacks of pain in his abdomen usually accompanied by listlessness, nausea and vomiting. Repeated x-ray studies corroborated the diagnosis of megacolon. All other findings were negative. The last hospital admission was on August 23, 1936.

X-ray studies on September 9, 30, October 9, and 19, all taken before this method of treatment was instituted, showed no improvement. X-rays January 6, February 10, March 12, 1937, during this treatment, show improvement.

General improvement was noticed a few days after treatment was instituted and was continuous. His general appearance became better, his appetite improved, pain disappeared, the abdominal distention became less marked and he became much more active.

After four months of this treatment a complication became apparent in that his sphincter became gradually more and more spastic though apparently quite normal at the beginning. This spasticity increased and even caused pain on the passage of the rectal irrigator. Dr. W. A. Fansler dilated the sphincter manually under gas anesthesia and relieved the spasticity. His stools have been normal for over ten months.

Case 3.—Emmett C., male, three and one-half years of age, was diagnosed as having congenital megacolon in early infancy. He had marked constipation with frequent attacks of pain, nausea, and vomiting. His abdomen was large and the distention became aggravated quite often. At the time of admission to the Minneapolis General Hospital, January 13, 1937, his complaint

CONGENITAL MEGACOLON—FRIEDEL

was an upper respiratory disturbance with middle ear involvement. After that cleared up a complete study was made of his case. The diagnosis of megacolon was corroborated by x-ray examination. He was treated by hot saline irrigations with good results. His stools

intracolonic tension." The importance of gentleness and taking plenty of time cannot be over-emphasized.

The work of Kappers¹¹ and Alvarez¹ further

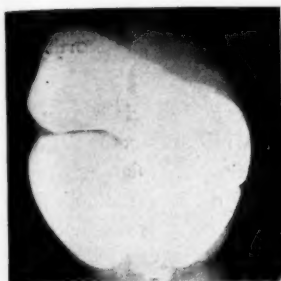


Fig. 2. Large colon.

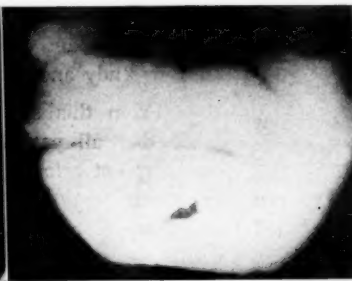


Fig. 3. Colon size reduced.

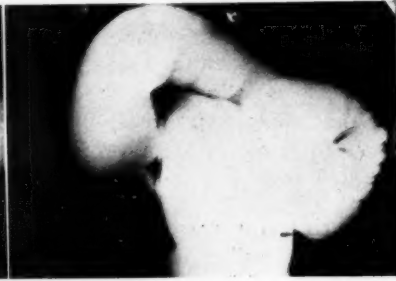


Fig. 4. Colon size more reduced.

became normal early in May, and he was discharged May 21, 1937, as improved.

The last two patients were taught abdominal exercises after the stools started to become voluntary; the exercises probably contributed some benefit.

Treatment of megacolon by hot irrigations must not be hurried. It might be better to suspend the treatment entirely than to hurry it. This method of therapy attempts to establish a better coördination between the sympathetic and parasympathetic nervous mechanisms of the colon which have been out of harmony or have probably never been established. But this mechanism has a tempo of its own which cannot be speeded up suddenly. Hurry or rough handling will frustrate our efforts, aggravate the condition and may even produce shock. We have observed more or less reaction every time we tried to rush the treatment or allow over-distention. At one time our first patient actually showed symptoms of shock when we produced marked distention by allowing a great deal of fluid to be retained. The need for gentle handling of the colon can well be corroborated by the physiologist,⁸ surgeon⁹ and internist.⁷ Erlanger⁸ showed experimentally how rough handling of the intestines produces shock. Homans⁹ states that "shock is caused principally by prolonged handling and mishandling of tissues . . . particularly within the abdomen or thorax." Gardner⁷ states that "the giving of a large test enema may reproduce the patient's symptoms by increasing



Fig. 5. (A) Large abdomen; (B) irrigator in position, showing peristaltic waves.

emphasizes the importance of the time element in the stimulation of the various parts of the alimentary canal, that the rate of conduction is slowest in the lower intestinal canal. Both of the above mentioned authors state that "the visceral regions keep a primitive type of nervous organization; that the plexuses of Meisner and Auerbach have a conduction rate similar to that in the ganglionic plexus of Coelenterates (20 cm. per sec.)."

The three patients here reported have responded to our efforts to establish normal bowel function. The rationale of this treatment can probably be explained as based on the following considerations:

1. Biologists have observed that tropical heat affords the organism a better opportunity for readjustment and evolutionary changes, as noted by Harold H. Plough and Phillip L. Ives.¹⁴ One wonders, therefore, if under the influence of this heat treatment the colon may not be afforded

a more favorable opportunity for peristaltic activity and in time even reduce in size because of such activity.

2. Garbat and Jacobi⁶ show that hot saline in the upper rectum stimulates the liver, an important detoxifying organ, to greater activity. They have demonstrated that 150 c.c. of one of several hot solutions start the flow of bile in a very few minutes and the flow may last over one hour.

3. Okay¹³ found direct relationship between peristalsis and increased circulation of the blood in the bowel wall.

4. Freyer and Gellhorn⁵ show that high temperature above 104° F. stops parasympathetic action and suspends the production of acetyl choline, but it does not stop sympathetic action.

5. Sir Thomas Lewis¹² shows that the sympathetics are relaxed at a temperature between 43° and 45° C. or 110° and 113° F. and that the response to the above mentioned heat is similar to the response of a local anesthetic. By using hot saline raised to 115° F. we probably overcome the undue tension that may be present in both the sympathetic and parasympathetic control of the colon. Under this comfortable heat both factors are probably afforded a period for activity with its handicaps temporarily allayed.

6. Gardner⁷ showed that mechanical distention of the upper rectum may produce symptoms of severe intoxication, which immediately disappear as the pressure is released. We observed similar occurrences in our cases whenever distention occurred. On one occasion in particular, as mentioned above, there was marked reaction, almost shock, and that was relieved with the gradual emptying of the lower bowel.

Conclusions

1. Three cases of congenital megacolon were treated with hot daily irrigation of saline at 115° F. with good results.

2. The method above described, because of its simplicity and absence of risk, is worthy of further study and trial.

3. From this small series no claim can be made that all patients with megacolon can be cured by hot colon irrigation. No damage, however, can be done by trying this method first, and those ultimately requiring a sympathectomy will be benefited and be better prepared by such irrigations.

Bibliography

1. Alvarez, Walter C.: *The Mechanics of the Digestive Tract*. New York: Paul B. Hoeber, 1922, p. 13.
2. Counseller, V. S.: Treatment of chronic infection of the pelvis. *Jour. Am. Med. Assn.*, 101:916-920, (Sept.) 1933.
3. Erlanger et al: Studies in secondary traumatic shock. *Am. Jour. Physiol.*, 49:90-116, 151-173, 1919; 50:31, 104, 119, 1919.
4. Feller, W.: Gonococemia with recovery. *Jour. Am. Med. Assn.*, 100:1149-1150, (Apr. 15), 1933.
5. Freyer, A. L., and Gellhorn, E.: Heat principle of autonomic nervous action; observations on the resistance to temperature of the endings of vagus and sympathetic in heart. *Am. Jour. Physiol.*, 103:392-399, (Feb.) 1933.
6. Garbat, A. L., and Jacobi, H. G.: Secretion of bile in response to rectal instillations. *Arch. Int. Med.*, 44:455-464, (Sept.) 1929.
7. Gardner, E. L.: The indications for and examination of the colon. *Minn. Med.*, 14:992-995, 1931.
8. Holden, F. C.: The Elliott treatment, a new method of applying vaginal heat. *Am. Jour. Obst. and Gynec.*, 22:87, (July) 1931.
9. Homans, John: *Textbook of Surgery*. Springfield, Ill.: Charles C. Thomas, 1936, p. 131.
10. Judd, E. S., and Thompson, H. L.: Megacolon: an analysis of sixty-five cases. *Minn. Med.*, 11:439-448, (July) 1928.
11. Kappers, C. U. Ariens: The evolution of the nervous system. Haarlem, Holland: DeErven F. Bohn, 1929, p. 15.
12. Lewis, Thomas: *The Blood Vessels of the Human Skin and Their Responses*. London: Shaw and Sons, 1927, p. 143.
13. Okay, K.: Quoted by Charles E. Pope. *Trans. Am. Proctology Soc.*, 1936, p. 48.
14. Plough, H. H., and Ives, P. T.: Heat induced mutations in orosophilia. *Nat. Acad. Soc. Proc.*, 20:268-273, (May) 1934.
15. Rankin, F. W., Barger, J. A., and Buie, L. A.: *The Colon, Rectum and Anus*. Philadelphia: W. B. Saunders Co., 1932, p. 83-84.
16. Rubrah, John: A note on history of hypertrophy of the colon. Charles Michell Billard. *Am. Jour. Dis. Child.*, 49: 736-738, (Mar.) 1935.
17. Rumph, Wm. H.: Treatment of salpingitis. *Minn. Med.*, 14:1028-1030, 1931.
18. Wade, R. B., and Royle, N. D.: Operative treatment of Hirschsprung's disease; a new method. *Med. Jour. Australia*, 1:137-141, (Jan.) 1927.

COMPRESSION FRACTURES OF THE SPINE*

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THIS paper is presented from the experience and observation of the general surgeon rather than that of an orthopedist and we hope that it will be so considered during the discussion which may follow.

Of a total of 886 fractures of all kinds taken care of in our group since 1933, thirty-four or approximately 4 per cent were compression fractures of the vertebral bodies. Of these, two involved the cervical, twelve the dorsal and twenty the lumbar vertebrae.

This 4 per cent is somewhat lower than the 6 per cent reported by other surgeons who take care of more than the average number of fractures encountered in general practice.

Due consideration has been taken in the series of vertebral body anomalies and abnormalities, in order that such may be ruled out. Among these changes in shapes and contour of the vertebral bodies, which are apt to confuse the surgeon and roentgenologist, may be mentioned the following:

1. Normal variations
2. Postural changes
3. Anomalies of development
4. Inflammatory changes
5. Changes in bodies due to intervertebral disc injuries
6. Metabolic changes
7. Malignancy

The diagnosis in all of our cases has been based on the history of a definite injury, with definite symptoms, x-rays before and after reduction, and follow-up x-ray studies.

Until a few years ago perhaps 75 per cent of compression fractures of the spine were overlooked by the average practitioner unless the patient complained severely of his back following injury, or had an associated paralysis which prompted x-ray studies. Many of these patients were left with permanent back disabilities.

In many instances no x-ray studies of any

kind were made or when made were taken only in the anterior-posterior position. Anterior-posterior and principally lateral studies are essential in the diagnosis of compression fractures, even following trivial injuries.

While the most important part in the diagnosis rests upon x-ray findings, it is also true that a carefully taken history of the *modus operandi* of the injury is equally important. Jack-knifing injuries such as falling backwards, landing in a sitting position, or driving under a low bridge while sitting on a wagon, or landing in an upright position with knees extended, are definite reasons to suspect vertebral body fracture, which call for thorough x-ray study of the entire spinal column regardless of the location of pain.

Four of our cases were fractures in patients taken care of in other well appointed hospitals within one week to six months following their original injury, in which only anterior-posterior x-rays were taken and the fractures missed. Several of our cases have been associated with fractures of the os calcis. Because fracture of the os calcis is frequently produced by the individual landing in an upright position, compression fracture of the spine is always a possible complication and should be suspected and investigated.

A case in point is that of a man who walked into an open pit, landing, after a drop of about 20 feet, in an upright position, with knees extended. When brought to the hospital he was in severe shock, with a fracture of the humerus, radius and ulna, a badly comminuted fracture of the upper end of the tibia and fibula, and a fractured os calcis. Owing to his complaints of these severe injuries, he complained very little about his back. Not until months after, when he was allowed to be on his feet, did he complain to any great extent about his back. X-rays taken at this time revealed severe compression fractures of the first and second lumbar. Results of treatment for his other fractures were satisfactory, but the man will always be unable to work because we had overlooked a compression fracture of his spine which, without question, if diagnosed

*From the Winona Clinic, Winona, Minnesota. Read before the annual meeting of the Southern Minnesota Medical Association at Winona, Minnesota, August 11, 1937.

COMPRESSION FRACTURES OF THE SPINE—NAUTH AND MATTISON

and properly treated at the time of injury would have made him a useful member of society. The modus operandi of his injury should have prompted us to look for a compression fracture of the vertebra.



Fig. 1. Method of reduction.

Another case in point was that of a man who dropped into a river bed in a standing position, then falling against some piling sustained five rib fractures and a fracture of the lower end of the tibia. He was in severe shock when brought to the hospital. Within twelve hours, he developed a traumatic pneumonia and was desperately ill. An anterior-posterior plate was taken of his chest to corroborate our diagnosis of pneumonia and chest injuries. This plate revealed what was reported by the hospital roentgenologist as an arthritic process of the twelfth dorsal vertebra. No lateral studies were made at this time in spite of this report, because following his recovery from pneumonia and other injuries, he made no complaint about his back. [Subsequent x-ray studies, however, did reveal a definite fracture.]

These were early cases which taught us important lessons, and I dare say that we have missed no compression fractures since that time. Multiple injuries to an individual should always call for x-ray studies of the spine.

In our experience and observation besides x-ray findings and the modus operandi of the injury, one of the most important symptoms and points of diagnosis is abdominal pain and rigid-

ity. In none of our cases have we failed to note this symptom commensurate in degree to the severity of the injury to the vertebra involved.

Visceral injuries following an accident have symptoms similar to those found in compression



Fig. 2. Patient hyperextended on Magnusen jack. Buttocks and shoulders supported by table. Plaster cast applied.

fractures, namely, abdominal pain and rigidity. However, in visceral injuries there is also localized tenderness over the organ involved. In compression fractures with abdominal pain and rigidity, there is as a rule no localized tenderness.

In our series of thirty-four cases, we had two cases of complete lower extremity and visceral paralysis with full recovery. These cases were treated by hyperextension, body cast, and traction followed by braces. Two patients with paralysis, prior to this series, on whom we did laminectomies, did not do so well. One died without recovering, about one year later, the other, while he recovered somewhat, is a wheelchair case for the rest of his life.

It is our belief from our experience that, since the average surgeon is not a neurologist, he is unable, when a back injury with paralysis presents itself, to make a diagnosis as to whether the cord is merely compressed or actually severed. We have not used the Quackenstedt test, therefore, do not know its relative value in settling the question. Edema and hemorrhage in and around the cord rather than a true blocking by bony displacement may confuse and render valueless the Quackenstedt test, except to those who have had considerable experience in its in-

COMPRESSION FRACTURES OF THE SPINE—NAUTH AND MATTISON

terpretation. Key and Conwell recommend reduction by manipulation and hyperextension in all cases before making the Quackenstedt test. According to the experience of surgeons relying principally on the extension methods for reduc-

the patients difficulty in the breathing. Both became cyanotic and had to be turned before the application of the cast was completed. We, therefore, adopted the following method which we have not seen described: The patient is

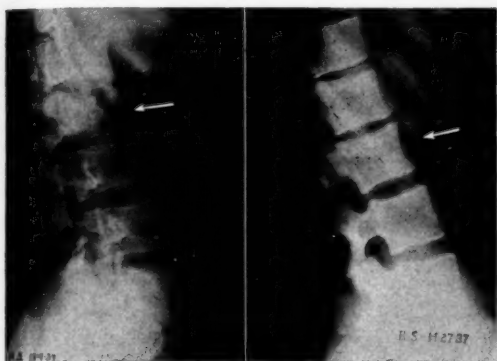


Fig. 3. Compression fracture of second lumbar vertebra with visceral and lower extremity paralysis. (a) Before reduction. (b) Eleven months later.



Fig. 4. Compression fracture of first lumbar vertebra. (a) Before reduction. (b) Eleven months later.

tion and recovery, there is only a small percentage of cases in which laminectomy is indicated.

One of our patients with a fracture of the second lumbar, developed, on the day following his injury and reduction, a paralysis of the entire left arm. X-ray studies revealed no injury to any of the cervical vertebrae. We assumed that this paralysis was caused by hemorrhage and pressure in the cord, described as hematomyelia by Dr. Hammes. This patient obtained full recovery of his arm within three months. We had one case of cervical body fracture with paralysis of the left shoulder and arm with full recovery following traction and cervical brace.

Treatment.—Many methods of reduction and treatment have been used successfully as long as hyperextension was the main factor in reduction and retention. Among these methods are the Magnusen jack, the Allen reduction table, the hammock suspension method, and the symphysis chest position with the patient face down. Manipulation in this position by a sudden sharp thrust downward at the point of injury is often attended by an audible sound when the impaction is reduced. This treatment is followed by a carefully applied body cast, with the patient in the hyperextended position.

In two of our cases with the chest-symphysis position we had considerable worry, because of

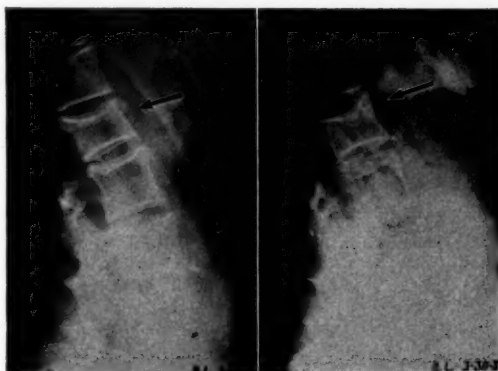


Fig. 5. Compression fracture of first lumbar vertebra. (a) Before reduction. (b) Ten months later.

anesthetized lying flat on his back, the table is straddled by the operator who places his arms with locked fingers under the patient's back at the point of injury, slowly suspending the patient until the buttox and shoulders are free from the table. He then gives a sudden sharp upward thrust of the body, then by dropping his locked hands he intercepts the drop of the patient and holds him in this position until the Magnusen jack is placed under him. The cast is then applied. We have had no respiratory complications with this procedure and have had equally good results. All of our non-paralyzed cases, regardless of the degree of compression,

if reduced, are permitted to be up and about in from one to two weeks. The cast is kept on for three months. Then a well-fitting Taylor brace is applied, made always from a plaster model of the patient in the hyperextended position. Such braces always fit perfectly.

Prognosis.—Prognosis is essentially very satisfactory if properly treated. All of the patients

in this series, including the two with paralysis, are well without major complaints, able to work and carry on practically as well as before injury. We think this justifies a good prognosis for the majority of patients who sustain a compression fracture of the vertebrae. Both compensation and private cases as a matter of fact have given us less trouble than other fractures as a whole.

A CLINICAL TEST FOR PREGNANCY*

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INTEREST in the possibility of securing an accurate intradermal test for the diagnosis of pregnancy has again been stimulated by the recent report of Gilfillen and Gregg⁴ on the intradermal use of Antuitrin-S. The advantages of such a test, if accurate, are self-evident.

Zondek³ and Aschheim¹ showed that there was present in pregnancy urine a large amount of gonad stimulating hormones. It is not known who originated the idea to utilize this substance in some way for the diagnosis of pregnancy; however, Porges and Pollatschek² were probably the first to report work of this kind.

The pregnancy urine gonadotrope was originally considered to be of pituitary origin, so that it is not surprising to find the above investigators as well as subsequent workers using anterior hypophyseal extracts for the same purpose. Deutsch⁵ in 1929 and Strauss⁷ in 1930 reopened the study, as did Dowell⁶ in this country in 1934. The results from all these sources were considered to be of no value, due to the high percentage of error. Gruskin⁸ in 1936 attempted to solve the problem by using a placental extract as an intracutaneous test. This was similarly found to be inaccurate.

It is not surprising, however, that failure followed these attempts since pituitary extracts containing the gonadotropic hormone also contain large amounts of extraneous matter. This would be true also of placental extracts.

Antuitrin-S was used by Gilfillen and Gregg⁴ in their work. They reasoned much the same as their predecessors that the pregnant subject

having a high concentration of the anterior pituitary-like hormone present should be "desensitized" or "immune" to its intradermal administration; further, that the reverse should obtain in the non-pregnant state.

Antuitrin-S contains two milligrams of solids per cubic centimeter. One milligram is the active hormone and the remainder is extraneous, inactive material of a non-protein nature. The potency is adjusted so that one milligram in 1 c.c. of solution contains 175 rat units of the hormone. The solution is adjusted to a pH of 7.1 or 7.2, this being the pH of optimal preservation of the hormone. The only protein in solution found by test is that directly attributable to the anterior pituitary-like hormone. That this hormone is protein in nature is undoubted although total nitrogen runs around 0.9 per cent. (The average protein is from 14 to 16 per cent nitrogen). Furthermore, Antuitrin-S varies negligibly in solid content, that is to say, the protein content is constant. If we may now theorize we might suspect that the hormone is an aggregation of complex protein molecules possibly resembling the polypeptides.

In this paper I am reporting pregnancy tests in 100 cases, not all of pregnancy, made with Antuitrin-S manufactured by Parke, Davis and Co., and Follutin manufactured by E. R. Squibb and Co. Sixty-one of these cases are my own and thirty-nine were run by Dr. James Morrow of Austin, Minnesota. Neither one knew the other was making similar tests. Dr. Morrow was kind enough to turn over his cases to me to be reported at this time.

Dr. Morrow's series includes two post-partem cases, two cases where the menopause had set in,

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 4, 1937.

CASE REPORT

and several questionable cases of pregnancy which were checked with the Friedman test. In his series Antuitrin-S affirmed the presence of pregnancy in four cases in which the Friedman test was negative. There were eleven cases of pregnancy positive both with Antuitrin-S, and the Friedman test. Six cases affirmed the absence of pregnancy while the Friedman test was positive. Two patients past the menopause gave negative results with both the Antuitrin-S and Friedman tests. Two patients sixteen and twenty-seven days post-partem respectively gave a positive Antuitrin-S reaction. Antuitrin-S was positive for pregnancy in three patients who were not pregnant.

In my own series I tried to adhere to the rules laid down by Gilfillen and Gregg, that is, to read the test in one-half hour and again in one hour. I found that I could not depend on the test to react in one hour's time. I found that the test might require six or eight hours to react, showing an absence of pregnancy, so that a reading in a shorter period of time would lead to an erroneous diagnosis. Antuitrin-S and Follutein were used, one to check against the other. There was one case of ectopic pregnancy where Antuitrin-S and Follutein both showed pregnancy present. Operation confirmed this diagnosis. In one case where an ectopic pregnancy was suspected the test showed pregnancy absent after six hours. The patient was not

operated upon and time has proved that pregnancy was absent. In six patients known to be pregnant, both Follutein and Antuitrin-S showed an absence of pregnancy. On repeated tests they both showed pregnancy absent. The remainder of the known pregnancy cases were confirmed with both Follutein and Antuitrin-S. In thirty non-pregnant patients the test showed an absence of pregnancy and none of the tests showed pregnancy when it did not exist.

Summary

From my observations I would say the test is more accurate if used to diagnose the absence of pregnancy. Further study must be made to determine why some reactions fail to confirm the presence of pregnancy.

Bibliography

1. Aschheim, S.: Die Schwangerschaftsdiagnose aus dem Harn durch nachweis des Hypophysenvorderlappen-hormons; praktische und theoretische Ergebnisse aus den Hornuntersuchungen. *Klin. Wchnschr.*, 7:1453-1457, (July 29) 1928.
2. Deutsch, Alfred: Über die Verwendbarkeit der Porges-Pollatschek'schem Schwangerschaftsprobe. *Zentralbl. F. Gynak.*, 53:2920-2921, 1929.
3. Dowell, D. M.: Preliminary observations on menstrual cycle and pregnancy with simple pregnancy diagnostic test. *Jour. Missouri Med. Assn.*, 30:275-277, (July) 1933.
4. Gilfillen, G. C., and Gregg, W. K.: New, rapid, economical test for pregnancy and certain gynecologic conditions. *Am. Jour. Obst. and Gynec.*, 32:498-501, (Sept.) 1936.
5. Gruskin, B.: Intradermal test for pregnancy. *Am. Jour. Surg.*, 31:59-61, (Jan.) 1936.
6. Porges, R., and Pollatschek, O.: Foreign letters-Vienna. *Jour. Am. Med. Assn.*, 93:559, 1929.
7. Strauss, H.: The Porges Pollatschek skin test for pregnancy. *Am. Jour. Surg.*, 8:1271-1272, 1930.
8. Zondek, B.: Darstellung des weiblichen Sexualhormons aus dem Harn insbesondere dem Harn von Schwangeren. *Klin. Wchnschr.*, 7:485-486, (March 11) 1928.

CASE REPORT

CHYLURIA*

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A WHITE, married woman, fifty-nine years of age, entered The Mayo Clinic on November 16, 1936, with the complaint that one morning while she had been collecting a specimen of urine for periodic urinalysis by her family physician she had noticed that it had the appearance of milk. The patient had had the urine examined on an average of four times a year for the past ten or twelve years but this was the first urine of abnormal appearance, to her knowledge. On four successive days before admission at the clinic the urine first voided, usually about 6:30 a. m., was milky, but all urine passed thereafter remained clear. Exclusive of chronic senescent arthritis of low grade, affecting one knee, and mild digestive disturbances after eating too heartily of rich foods, the patient made no other

complaint. Recently she had lost 8 pounds (3.6 kg.) as the result of voluntary dietary restrictions.

Physical examination gave essentially negative results. The blood pressure and temperature were within normal limits. The urine had a decidedly milky appearance. It was necessary to convince the laboratory technician that it was not milk before she would undertake examination, for a week previously a young mother mistakenly had sent a small bottle of milk for examination instead of the child's urine which had been collected in a similar bottle. The specific gravity was 1.023; albumin and sugar were absent. Microscopic examination disclosed a few erythrocytes and about 20 leukocytes per low power field. The presence of chyle was determined by further chemical and microscopic examination. A catheterized specimen, obtained the same day, was free of erythrocytes and leukocytes. The concentration of blood urea was within normal

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Southern Minnesota Medical Association, Winona, Minnesota, August 11, 1937.

CASE REPORT

limits. There were no significant changes in the ocular fundi. Roentgenographic examination of the urinary tract, including an intravenous urogram, roentgenographic examination of the organs of the thorax, as well as roentgenoscopic examination of the stomach and duodenum, failed to disclose evidence of any abnormality.

The patient returned a month later for further examination of the urinary tract in order to determine whether the chyle issued from one or from both kidneys, or from a lower level, and whether there was a fistulous communication with the lumbar lymphatic structures. Whether or not such communication was demonstrable, it also was decided at this examination to inject the contrast media under pressure while doing retrograde pyelography because this procedure had been known to interrupt such a fistulous communication, with permanent disappearance of chyle from the urine. Cystoscopic examination was carried out early in the morning, before the patient had voided or had assumed an erect position. Clear urine was found to issue from the meatuses on both sides. The first catheterized specimen from the left renal pelvis appeared to be clear but the second one was slightly turbid and milky in appearance. This specimen also clotted soon after its collection. Chemical and microscopic examination of this milky specimen revealed the presence of chyle but absence of filaria and bacteria. Retrograde pyelography disclosed that the outlines of the right renal pelvis, calices and ureter were normal. The pelvis of the left kidney and ureter also appeared to be normal. Beyond the tip of the lower calix apparently there was some small extravasation but evidence of a lymphatic communication was lacking. The contrast media was injected under pressure and there has been no recurrence of the chyluria up to the present time.

Under the title "nonparasitic chyluria" two previous communications dealing with cases encountered in the clinic have been made. The first one was made by Allen in 1933, who reported two cases, and the second by Wakefield and Thompson, whose article appeared July, 1937, in the *Journal of Urology*. This latter article dealt with five cases encountered in the clinic up to January, 1937, and included the cases reported by Allen and the case presented herewith, briefly summarized. More than 100 cases of nonparasitic chyluria have been reported so far in the literature.

A few features of clinical interest, as they pertain to this case, may be discussed. In the first place, the possibility of parasitic origin of the chyluria cannot be ignored; neither can it be definitely proved. The patient had traveled extensively at home and abroad and in former years had sojourned for long periods in areas where filariasis was endemic, such as Charleston and Camden, South Carolina, and Cairo, Egypt. However, repeated examinations after the patient entered the clinic, of concentrated specimens of venous blood, failed to disclose the presence of filaria. Their absence would not exclude parasitic origin of the condition because they could cause lymphatic blockage by their dead bodies or by inflammatory fibrosis of the lymphatic vessels. Cookson and Pullar maintained that "if the patient has been at any time resident in a district in which filariasis is endemic, the chyluria may be assumed to be filarial unless convincing evidence of another etiologic factor is forthcoming." Another fea-

ture of clinical interest is the fact that the urine was milky only when first voided in the morning. This feature also was characteristic of one of the cases reported by Allen. Apparently the horizontal position favors retrograde lymphatic flow to the renal pelvis. The patient also noticed that rich, fatty meals tended to aggravate or precipitate the chyluria. Such meals possibly would be sufficient to cause a fresh discharge of chyle by increasing the flow of lymph in the vessels of the mesentery. The chylous urine seems to be the only symptom in the majority of the cases reported and this feature was exemplified in this case. Colic or discomfort, the result of coagulation of the urine before it is voided, sometimes occurs but it was not observed in the case here reported. In the interval of one month between the first and second examinations, the patient complained of some loss of weight and energy but this was attributed to a state of anxiety rather than to the loss of fat. Authorities are agreed that loss of fat which does not exceed 400 calories daily is negligible and does not account for the malnutrition and weakness of some of these patients.

In the presence of a milky urine one must exclude such possibilities as pyuria from any cause, phosphaturia, lipuria, and artificial or purposeful additions to the urine. The most elementary chemical and microscopic examinations should suffice to make a satisfactory identification of the causative substance from the laboratory standpoint. The obvious absence of those serious conditions which usually give rise to lipuria (advanced diabetes mellitus, tuberculosis, pancreatic disease, fracture of the bone, fat embolism and so forth), in the presence of fat in a molecular form, and other laboratory criteria, fairly definitely exclude lipuria. Of course it was felt that lipuria should be excluded because the patient tended to be a gourmet. Schöndorff has observed increased amounts of urinary fat after hearty eating of fatty food and after the use of fat-containing medicaments. Moreover, according to the secretory hypothesis of the genesis of chyluria, fat exists in the blood in excess and is passed by the renal epithelium. The first of these two possibilities was dismissed because chyluria occurred in the absence of dietary indiscretions and disappeared after treatment in spite of the patient's eating rich meals. The secretory hypothesis, in contrast to the mechanical one, does not rest on any secure foundation and now has few supporters. Moreover, the recent investigations of Elkan, on blood fat in cases of nonparasitic chyluria, seem definitely to nullify the secretory hypothesis.

References

1. Allen, E. V.: Nonparasitic chyluria. Proc. Staff Meet. Mayo Clinic, 8:477-480, (Aug. 9) 1933.
2. Cookson, H. A., and Pullar, T. H.: True nonparasitic chyluria associated with menstruation: report of a case. Arch. Int. Med., 53:878-884, (June) 1934.
3. Elkan, O. T.: Die nichtparasitäre Chylurie mit besonderer Berücksichtigung fortlaufender Blutfettbestimmungen. Zentralbl. f. inn. Med., 57:697-713, (Aug. 29) 1936.
4. Schöndorff, B.: Quoted by Strauss, Ludwig: Über passagere Chylurie. Ztschr. f. urol. Chir., 38:347-352, 1933.
5. Wakefield, E. G., and Thompson, Gershom: Nonparasitic chyluria. Jour. Urol., 38:102-110, (July) 1937.

HISTORY OF MEDICINE IN MINNESOTA

ORGANIZATION OF THE ST. LOUIS COUNTY MEDICAL SOCIETY

By RICHARD BARDON, M.D.

IN a preceding account of the medical history of Northern Minnesota, an introduction explained the historical background of the early practitioners who were fur traders and explorers as well as doctors. This period ended with Dr. Borup, who eventually located in St. Paul in 1848.

The period from 1854 to 1886 is of vital importance, not only to Duluth but to St. Louis County as well. Up to 1854 Northern Minnesota was Indian country. In that year a treaty was negotiated with the Chippewas at La Pointe, Wisconsin, and as a result Northeastern Minnesota was open to settlement by the whites. No settlement within the present confines of Duluth was made until about 1855 or 1856, and that was very scattered. The settlement in Oneota (now West Duluth) and the present site of Duluth hardly got under way when the depression of 1857 came along, and, with the Civil War impending, settlement was entirely given up for the time being. During the Civil War and up until 1869, there was no doctor permanently located in what is now Duluth or St. Louis County. Previous to this a few pioneers who lived in the present Duluth were attended by the doctors from Superior, who, during the same period, were not very numerous. It may be of interest here to state that the chairman of the first board of county commissioners was Dr. W. W. Mayo, who was the medical officer with the Territorial Survey which laid out the northern counties of the state. There were few inhabitants in this territory. At Rice's Point, where Duluth now stands, there was one cabin, but the trapper who lived there was away, and Dr. Mayo was made temporary chairman of the board of county commissioners, an office which he held for about six weeks, until someone who lived in the county could be found to take his place. The records of the county auditor's office do not throw any light on this early appointment, but inasmuch as the office was temporary, doubtless no record was ever made. However, St. Louis County and the City of Duluth are proud to have the name of Dr. Mayo listed among their pioneers.

The earliest mention of the medical profession in the present City of Duluth is taken from the diary of the Reverend Mr. Pietetzl, who spent much time among the Indians as a missionary along the south shore of Lake Superior. In 1859 he was located in the village of Oneota, and mentions that at that time one of his children was ill with a severe cold that he thought might be scarlet fever, and when the second child became much more seriously sick he called in Dr. John A. Thomson from the village of Superior, across the bay. Dr. Thomson confirmed the diagnosis. As there is no record of the child's death it may be assumed that the doctor's ministrations were successful. Dr. Thomson located in Superior in the fall of 1859, and on November 13, 1860, married Helen Rowena Abbott, daughter of Dwight and Jane Abbott, at Oneota. Shortly afterward Dr. Thomson moved to Hastings, Minnesota, and in a list of physicians

and surgeons in Merwin's Business Directory of Minnesota for 1869-1870 his address was given as "Ramsey Street, Hastings, Minnesota." Dr. Thomson died in Philadelphia on March 19, 1869, while on a visit to his father.

Dr. Thomson, born July 11, 1830, at Wilmington, Delaware, was descended of Colonial stock. His ancestors were prominently identified in civil and military capacities during the American Revolution, and received many honors for this participation. His father, Dr. James William Thomson, was a Virginian, related to many prominent Virginia families, including the Washington, Lewis, Warner, and Throckmorton families. Dr. Thomson was a man of considerable education and refinement. He graduated from Jefferson Medical College in 1851. Thereafter he did post-graduate study in Vienna, and traveled extensively abroad in Italy and Palestine.

It will be seen, then, that during the period of 1855 to 1869, Duluth had no resident physicians, and whenever necessary the doctors came from Superior. It was during this period that the pioneers had to make use of the remedies that were at hand. There are the usual stories of the midwives, the "bone setters," and the various people who had a natural bent for treating sickness. There is also the story concerning the occasional Indian who, with "tea" made from various herbs, could cure dropsy and other allied conditions. Stories are told of the treatment of gangrene by amputation and searing the stumps with red-hot frying pans! True, the people were hardy and vigorous, and possibly needed little medical attention.

Probably the first physician to locate permanently in Duluth was Dr. Edward Erastus Collins, who arrived in May, 1869. Dr. Collins was born July 26, 1833. He attended public schools in New York state, and the Brookfield Academy in New York City. After graduating from the medical college of New York in 1857, he practiced medicine in that state for a number of years, and was a contract surgeon in Washington, D. C., during the Civil War. In the winter of 1868-1869 he attended a series of lectures at the Chicago Medical College, after which he moved to Duluth. Dr. Collins practiced here until 1874, when he removed to Minneapolis, where he remained for four years. He next moved to Stoughton, Wisconsin, but returned to Duluth in 1881, where he lived until his death in 1912. Dr. Collins was a charter-member of the county medical society. Later he also engaged in the real estate business. He is best remembered as the kindly pioneer type of physician.

About the same time there were other doctors who located in Duluth, but how long they remained is unknown. In the *Duluth-Minnesotian* there appear the business cards of professional men recently located in the city. On May 19, 1869, is the name of "Guy M. Daly, Physician and Surgeon"; for June 19, 1869, "D. G. Saivy, Physician and Surgeon"; and on July 3, 1869, "T. R. Potts, Physician and Surgeon." Very little is known about these men, except that Dr. Daly practiced in Superior before coming to Duluth. Dr. Potts was graduated from the University of Pennsylvania in 1831, and was a relative of H. H. Sibley and Franklin Steele, who were well known in early Minnesota affairs. Dr. Samuel Carson McCormick arrived in Duluth in April, 1870. The reason for this sudden increase in the medical profession was the advent of the railroad connecting St. Paul and Duluth. With the completion of the railroad in 1870 Duluth began to grow. Dr. McCormick was born in Union County, Pennsylvania, September 8, 1837. He graduated from Jefferson Medical College at the outbreak of the Civil War, and immediately joined the Union forces as an army surgeon. He served with distinction throughout the war. His desire for ad-

venture still unsatisfied, he went West as a surgeon on the Union Pacific Survey, where he met the famous characters of the Wild West. Subsequently he located in Duluth. Dr. McCormick was married in 1871 to Miss Louise Smith of Superior. Her father, Dr. Vespasian Smith, had been a resident of Superior since 1857. The name of Dr. McCormick figures very prominently in the early annals of medical history in Duluth and St. Louis County. A news item for November, 1872, is interesting: "Dr. S. C. McCormick has just received a fine horse from St. Paul. Dr. Collins' purchase of a fine buggy horse seems to be contagious." A previous item stated that Dr. E. E. Collins "exhibits a fine horse, which receives the encomiums of all judges of horseflesh" In 1872 a further notice states: "Dr. McCormick has removed his office from the Bloomer Block on the Foster Lot to the building opposite—the new Hayes Brick Block, upstairs next in the rear of Col. Gow's Northern Pacific Office. The doctor has a beautiful room and his patients will no doubt want to be sick on purpose to have a prescription written from such a pleasant locality."

During the period from 1870 to 1873 Duluth increased in population, and other doctors located there, among whom were Dr. O. B. Bird, a homeopath, a Dr. Hanley and the Doctors Tanner, who came in 1871 but moved to Hudson, Wisconsin, in 1873. Their professional announcement read:

H. S. TANNER, M.D.

MRS. M. J. TANNER, M.D.

Eclectic and Homeopathic Physicians offer their professional services to the citizens of Duluth and vicinity. The diseases of women and children made a specialty. Office and residence First Ave. West opp. Clark House.

Office hours from 10 to 12 A. M. and 1-3 P. M.

Carefully prepared Homeopathic medicines for family use kept for sale at our offices.

Later, Dr. Tanner achieved considerable publicity on account of his lengthy fasts. In January, 1881, the following note appeared: "Dr. H. S. Tanner began his 40 day fast yesterday at the Clarendon Hotel."

Dr. S. S. Walbank moved from Superior in 1871, and made his home in Duluth until his death in 1890. A newspaper clipping for May 4, 1890, reports his death:

"After a three weeks' illness, Dr. S. S. Walbank, one of the oldest and best known citizens of Duluth, passed into the great beyond. His death occurred yesterday afternoon, caused by pneumonia.

"Dr. Walbank was born April 30, 1823, at Morton Homestead, Devonshire, England. His medical education was received at Toronto University in 1848. He came to Superior in 1869, and cast his lot with Duluthians three years afterwards, and has since remained here. Dr. Walbank has since been identified with many of the leading projects for the upbuilding of the city. Himself and Dr. S. C. McCormick were, for a long time, the only medical practitioners in Duluth. His sterling worth and integrity as a business man, his uniform kindness and courtesy to all, has endeared him to all who knew him."

Dr. Vespasian Smith, who had lived in Superior since 1857, moved to Duluth in 1871 or shortly afterward. Dr. Smith figures frequently in the early civic and medical development of Duluth, and was mayor for two terms (1873 and 1874).

In the "History of St. Louis County," page 472, there is an episode worth recording:

HISTORY OF MEDICINE IN MINNESOTA

"Dr. Vespasian Smith was a staunch, sterling old character, that builded well with his great common sense, while enlivening his fellows, as they went, with his kindly humor. He became mayor of the city in April, 1873, and he got 226 votes, but one being cast against him. When his term was out he was again elected, but he was not so fortunate this time, for there were three votes cast against him. He used to say that the only vote against him the first time was his own, but that during his second term he made two enemies, so there were three votes against him on his second election."

Dr. Smith was born in Mount Vernon, Ohio, October 23, 1818, of old Virginia stock. He first showed an inclination to become a trader among the Indians, but after only a year took up the study of medicine under a preceptor, later attending the medical department of Western Reserve University, from which he was graduated in 1851. After practicing for several years in smaller Ohio towns he came to Superior in 1857. Evidently he was quite a politician, for he was soon appointed physician to the Chippewas at the Bayfield agency. Thereafter he held some political appointment continuously, from his first under Buchanan until the time of his death, with the exception of the Cleveland administration. He was a member of the Minnesota State Board of Health for twenty years. Inasmuch as Dr. Smith figures frequently later on in this narrative, his activities will not be further enumerated at this point. He died in 1897. His son, Frank Smith, owned and operated one of the earliest drug stores in Duluth.

One of the early medical pioneers of Duluth, who was not actively engaged in medical practice, so far as could be ascertained, was Dr. Thomas Foster. He came to Duluth in 1868 from St. Paul. Dr. Foster published the first newspaper in Duluth, the *Duluth-Minnesotian*, which appeared on April 23, 1869. Dr. Foster was a unique character, and a biographical sketch of his life is interesting, not because of his work as a physician but because of his political activities. He was born May 18, 1818, in a southern suburb of Philadelphia. He studied medicine for a time under the preceptorship of Dr. Ord of Lewistown, Pennsylvania, but gave it up to enter the newspaper business and engage in politics. While in Uniontown, Pennsylvania, he again took up the study of medicine, and probably practiced for a short time, when he returned to the newspaper business and politics. In 1848 he became secretary of the Whig State Committee of Pennsylvania, of which Alexander Ramsey was chairman. Dr. Foster accompanied Ramsey to Minnesota as his secretary when Ramsey was appointed territorial governor. When Ramsey became state governor Dr. Foster was again appointed his secretary. For a time previous to 1860 he published the *Daily Minnesotian* in St. Paul. He served in the commissary department of the army during the Civil War, with the rank of captain. In 1867 Dr. Foster was chairman of the Republican state committee of Minnesota. The same year he edited the first daily paper in Minneapolis, *The Chronicle*. In 1868 he arrived in Duluth. Just how long he remained there is difficult to state, as the paper soon passed out of his control. He eventually obtained a clerkship in the postoffice department in Washington, and in 1902 moved to San Francisco, where he died shortly thereafter.

During the early seventies epidemics of scarlet fever were frequent. In a column of the *Daily Minnesotian*, under the caption "Local Rip-Raps," was the statement pertaining to "that terrible epidemic to children of scarlet fever, which still continues to linger in our city, and many of the little ones are lying under its dreadful scourge." In subsequent issues it appears that the epidemic continued to afflict the city until the spring of 1876, with consequent mortality to many children. During the winter, records show that schools were closed in an effort

HISTORY OF MEDICINE IN MINNESOTA

to control the spread of infection. In 1876 it was reported that Dr. S. C. McCormick was health officer and Dr. Vespasian Smith was appointed "a private member of the board of health." About this time Drs. J. L. Graham and C. H. Graff arrived in Duluth.

The coming of the railroad and the cutting of the canal in the early seventies was a great stimulation to the struggling village. In the panic of 1873 Jay Cooke, who financed the Northern Pacific, failed and the city was at a standstill. However, with the discovery of iron ore on the Vermillion Range in the early eighties, and with the development of the lumbering industry, the city began to grow rapidly. Throughout this period the medical profession was unorganized. Hospital facilities were lacking until the establishment of St. Luke's in 1882. There is mention of a "temporary hospital" in 1871, but evidently it did not grow into a permanent institution. St. Mary's Hospital was not founded until 1888.

The newspaper reported for February 2, 1882, that "Dr. Bowman had a telephone put in his office in the Hayes Block yesterday."

The Board of Health was created in 1884, and "the streets and alleys of the Village were thoroughly inspected and several old timers were deprived of their almost immemorial privileges of keeping pig-pens underneath their neighbors' windows and of maintaining other nuisances to the neighborhood, much to their indignation."

This was Duluth at the time the St. Louis County Medical Society was proposed.

The exact date of the formation of the St. Louis County Medical Society was unknown until December, 1936, when on checking through some of the old newspaper files it was ascertained that the year of the founding was 1886 instead of 1887 as recalled by Dr. McComb. The early records of the Society have been lost or misplaced, and there are various theories as to just what happened to them. There is the story that they were burned when fire destroyed an office building. However, this is somewhat questionable and no doubt they were thrown out, as so many historical records have been in the past. In the newspaper files for June 26, 1886, this item appears:

A CALL

To the Physicians of St. Louis County

Notice is hereby given that a meeting will be held for the organization of a County Medical Society of St. Louis County, Thursday next, July 16, 1886, at 8 p. m., at Dr. McComb's office.

This is interesting, because Dr. McComb stated that the first meeting was in the office of Dr. S. C. McComb in the Norris-McDougall Block, which at that time was a popular building for doctors. On the following day there was a notice in the paper reporting that

"The St. Louis County Medical Society met in council on Thursday night, July 16, to form a county association for mutual protection and improvement, and after the preliminary business a committee was appointed to draft a table of fees and report thereon at the next meeting. The following well-known medical men were elected as officers for the ensuing year:

President	Dr. V. Smith
First Vice President.....	Dr. A. F. Ritchie
Second Vice President.....	Dr. S. C. McCormick
Secretary	Dr. Stocker
Treasurer	Dr. McComb
Censors	Drs. Sherwin, Magie and Speier

HISTORY OF MEDICINE IN MINNESOTA

"The elections being decided, the meeting adjourned, to meet on the second Thursday in August, and will meet on the second Thursday in each and every month."

There is very little known about the early meetings of the society except that Dr. McComb states that the meetings were rather informal and discussions were always in order. Dr. Stocker apparently was a very careful secretary, and it is certainly a calamity that his records have not been preserved so that we might have first hand information as to just what went on. Those who saw the early minutes always recall the perfection of the handwriting and the great detail and exactness of Dr. Stocker's reports.

During the year 1886, in cooperation with the Duluth Chamber of Commerce or its predecessor, an attempt was made to get the State Medical Society to meet in Duluth the following year. This was successful. Dr. McComb recalled that the meeting was successful in many ways, inasmuch as he was elected president of the state society and was introduced to the members by the late Dr. W. W. Mayo. At that time Dr. McComb was only twenty-nine years of age, and had been a resident of Duluth since 1883. Subsequently he had been president of the county society on two occasions the second time during a state meeting there, but he was unable to supply the exact dates.

In a newspaper file for September 10, 1887, there is a note on a meeting of the St. Louis County Medical Society, and it is of sufficient interest to have it reproduced:

"A meeting of the St. Louis Medical Society was held in the office of Dr. Magie on Thursday evening, at which the following members of the profession were present: Drs. Ritchie, McComb, McCormick, McAuliffe, Judd, Speier, Sherwin, Davis, Magie, Stocker and Dr. Specht of West Superior. Pres. Ritchie occupied the chair and Secretary Stocker recorded the minutes. The first paper on 'The Ophthalmoscope as One of the Main Factors in Diagnosing Obscure Diseases,' was read by Dr. McAuliffe. A discussion followed, in which various members gave their experiences on the subject. An oral debate opened by Dr. Stocker was quite interesting. It was in regard to 'The Treatment and Causes of Summer Complaint and Intestinal Catarrh.' Another discussion was participated in by several regarding 'Contraction of the Pupil and Affection of the Eyesight Resulting from Injuries to the Spine.' Dr. Stocker led this discussion also."

The calibre of this program is remarkable, and is an indication of the progressiveness of the young society.

There is another notation in the newspaper for June 16, 1887, which stated:

"The Medical Association will commence tomorrow morning at 10 o'clock. Dr. S. C. McCormick, Chairman of the committee of arrangements, requests 'The News' to say that, owing to the unavoidable absence of Dr. H. H. Kimball, Pres. of Minnesota State Medical Society, Dr. W. L. Beebe of St. Cloud, 1st Vice Pres., will be the acting President. The Society will be divided into two sections. Dr. R. D. Barber of Washington, 2nd Vice Pres., will preside over the first section and Dr. A. Holmes of Oronocco, 3rd Vice Pres., will preside over the 2nd section."

It is of interest to note that at the very first meeting of the county society there was some question regarding a standardization of the medical fees. Dr. McComb states that it was customary at that time to get \$1.50 for a day call and \$1.00 for an office call, or, as he calls it, "a prescription." After considerable debate the society decided to raise the day calls from \$1.50 to \$2.00. This, according to some of the members, was not entirely sufficient, but it eventually became the standard fee for a good many years.

The first annual banquet of the society was held at the Spalding Hotel in 1895, and it was customary during those years not only to have a sumptuous

HISTORY OF MEDICINE IN MINNESOTA

repat but plenty of liquid refreshments as well! In 1895 the state society again met in Duluth and the local committee in charge of arrangements was Dr. W. H. Magie, chairman, Dr. C. F. McComb, Dr. C. A. Stewart, Dr. S. C. McCormick. At that time Dr. Justus Ohage of St. Paul was president, and the meeting was on June 19.

The decade from 1880 to 1890 saw many changes in the medical profession, and Duluth as well. The hospitals were being developed, the Board of Health set up, and the medical society organized. Sanitary conditions in the city, however, continued to be a source of dissatisfaction, with typhoid an ever present menace.

The "Mortuary Report" for September, 1888, furnishes an interesting sidelight on vital statistics of the period:

"Total Number of deaths reported.....48

"Cause	1 Railroad accident
	1 Drowning
	1 Capillary Bronchitis
	6 Cholera Infantum
	1 Convulsions
	2 Diarrhea
	2 Dysentery
	1 Enteritis
	1 Entero-colitis
	2 Heart disease
	1 Pulmonary hemorrhage
	1 Indigestion
	1 Marasmus
	1 Chronic nephritis
	2 Phthisis pneumonia
	1 Traumatic peritonitis
	17 Typhoid Fever
	7 (Not reported)

Dr. Sherwin,
Health Officer."

The population of the county was increasing rapidly, and many physicians whose names are now familiar appeared in the news of the times.

(To be continued in April, 1938, issue)

EDITORIAL

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BUSINESS MANAGER

J. R. BRUCK

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Social Scientists and Medical Care

MICHAEL DAVIS, Ph.D.,* of New York, has recently circularized the profession quite generally and has codified the "Social Scientists'" viewpoint in regard to "organized medical care." These two final sentences in his summary deserve impartial scrutiny: "Medical service must be judged from the point of view of the people who receive and pay for it, as

*Facts and issues regarding public medical care, New England Jour. Med., 218:143-47, (Jan. 27) 1938.

well as from the standpoint of the physicians and institutions that furnish it. The participation of medical and social scientists is therefore needed in appraisal as well as in planning, and the rate and smoothness of progress will depend largely upon ungrudging coöperation between physicians and the public."

It would appear that the *science* in *social* achievement is on a par with that which obtains in Medicine, if we are to accept the author's thesis. It is not for us to acclaim that we represent science in all our medical achievement. Much of what we individually accomplish may well be grouped under priestly or even less dignified effort to appease the unrest inherent in man's conflict with his consciousness.

We may go a considerable distance with the social propagandists and lend them recognition, and even example (should they seek to follow it), in seeking to utilize science in their economic and humanitarian efforts, but at this time it is only reasonable to ask them how far they have gotten. Some ten years ago I overheard in Switzerland a distinguished Continental economist remark that social economics and political government were at the stage of scientific attainment that Astronomy held when Copernicus announced his theory of the universe! It is said that one of the major causes for wreckage in the recent German Republic was the attempt to accomplish social and economic security by edicts. Many of these dealt with matters of health, unemployment, old age, and the usual penalties of circumstance. Idealistic efforts no doubt added to the immediate popularity of a socialistic regime. It all looked very promising on paper. Within a comparatively short time, however, these measures lent disaster, not only to organized medicine but to the economic stability of a country tested far beyond its capacity. Reform had outrun itself.

Missionaries have long resorted to approaching the heathen's soul via the route of caring for his bodily ailments. There is a subtle compliment to our profession in that observation. These social and economic reformers would en-

MINNESOTA MEDICINE

joy teaming up with us in order to make more palatable a re-deal of the cards in a game in which they establish most of the rules and base all of them upon experiment. "The public medical care" is indeed a problem. However, the success in the Twin Cities, in Minnesota, of the hospital insurance plan for employed groups, would indicate that the hospitals at least are far from ready to turn over their management to governmental bureaucratic guidance. Movements of this order point the way for tying up our scientific heritage with such portions of social advancement as are workable and judicious. We have come a long way in a muddling world; and for the most part independent of Government subsidies or entanglements. Whatever socialization we absorb should be like the dosage of our drugs—"quantum sufficit," and no more.

E. L. T.

Marihuana

THE rumors that have been growing more insistent the past few years about the increasing use of marihuana in our country, evidently have some basis in fact. Marihuana, also spelled marijuana, is the term used for that portion of the plant *Cannabis Sativa*, a species of Indian hemp, containing the drug. Although all but one of the states have had laws governing the raising and use of Indian hemp, last summer the Federal government took cognizance of the growing evil and passed the Marihuana Tax Act. An article* written from information furnished by H. J. Anslinger, United States Commissioner of Narcotics, and abstracted in the *Reader's Digest* for February, emphasizes, perhaps with overemphasis, the enormity of the growing evil.

Indian hemp grows wild in all parts of the United States and is cultivated in the east. Its stalk has commercial value, while *Cannabis Indica* preparations are obtained from the flowering tops of the plant and its resin.

The drug may be taken by mouth or can be incorporated in a cigarette, which method is said to have originated in Mexico and to have spread into this country rapidly the past two or three

years. These cigarettes, known as reefers, are being peddled particularly to the youth of the country.

The drug and its psychic effects are not new. Homer described how it made the victims forget their families and turned them into swine. It is the hashish of Oriental reputation. While its action is unpredictable it usually causes hilarity at first, loss of judgment and eventually somnolence. During stimulation the mind acts so nimbly that the passing of time seems slowed. Most atrocious crimes have been committed following the use of the drug. Our word "assassin" is derived from this Arabic word "hashish."

The Federal Marihuana Tax Act requires registration of all those who grow or handle the plant. The mature stalks of the plant are excepted. In an effort to control marihuana, physicians wishing to prescribe *Cannabis Indica* preparations are required to pay a special tax of one dollar yearly and keep a record of their prescriptions. Needless to say, few physicians will wish to prescribe the drug, for its narcotic effect for which it is mentioned in pharmacopœias is far surpassed by many safer drugs.

The widespread wild growth of Indian hemp will make its control difficult. The very fact that it is so available, however, has prevented marihuana from coming under the control of gangster syndicates. Publicity and emphatic warning of the grave danger incident to the use of the weed will, it is to be hoped, nip in the bud the spread of the traffic in the weed.

Mea Culpa and Its Author

EVER since the days of Tobias Smollett (1721-1771) and Oliver Goldsmith (1728-1774), both of whom were rank failures as physicians, the pursuit of literature as an auxiliary to the profession for which they were originally trained has appealed to medical men. Many who were wholly unknown in medicine have become famous as writers. Some, like Oliver Wendell Holmes and S. Weir Mitchell, made substantial contributions both to medical and general literature and were eminent in both professional fields, but that is unusual. Gen-

*Anslinger, H. J., with Cooper, Courtney Ryley: *Marijuana—Assassin of youth*. American Magazine, July, 1937.

erally speaking, when a man has made his mark as a writer he has abandoned medicine; there have been very few exceptions to this rule and the two last named were not among them, in their later years.

Contemporary writers who began as physicians, like Deeping, Maugham and Cronin in England, Léon Daudet and Georges Duhamel in France and others in this country, have been mentioned in some detail in these columns by the present writer (MINNESOTA MEDICINE, December, 1935) and further reference to them at this time is unnecessary. But another French physician-author was referred to casually and it is to his later efforts and his own peculiar life and personality that brief consideration is now being given.

Louis-Ferdinand Destouches was born in 1894 in Asnières, a small pleasure-resort suburb on the left bank of the Seine, three miles north of Paris. After a boyhood of poverty and misery he found himself, at twenty, sent to the front in the first stresses of the World War, out of which he came with a brain injury, a definite psychosis and functional cerebral disturbances which have never disappeared. He studied medicine, with intermissions for economic reasons in which he went first to the French colonies in Africa, later finishing his studies and writing the doctorate thesis which gained him his degree in 1924. Then he went to the Ford factories and filled a medical post at Dearborn, afterwards going to Africa under the auspices of the Rockefeller Institute to investigate tropical sleeping sickness.

Back in Paris, finally, he secured an outpatient connection with a hospital in the Montmartre district, picked up some practice among the poor and then began writing. His first effort was a laborious affair, immensely bulky and so fantastic and radical that he refused to allow it to be published as his own. Our comment on it at the time was that "in form it resembles closely a very prolonged example of what our psychiatric friends would call a 'flight of ideas.'" Destouches said that its publication over his own name would indicate that he was not merely exposing himself to mockery but also making the whole literary profession appear foolish. This was his *Journey to the End of the Night* and he ultimately allowed it to appear, in

1932, as the work of Louis-Ferdinand Céline, the last being the name of his mother, a pen name which he continues to use. This book aroused a perfect tempest of vituperative criticism and also stimulated the vigorous support of an influential band of well known literary critics. Widely translated, it made him world famous.

His next effort, published in 1936, not yet available in translation, is entitled *Mort à Crédit* (Death in Deferred Payments, or on the Installment Plan, as you please) and is said to be another bulky volume, "even more impressive than the first, more profound, more daring, more shocking, and more penetrating in its exploration of life."

But the book which has excited the present remarks is a small volume of 175 pages, recently published with the title of *Mea Culpa* and *The Life and Work of Semmelweis*, translated by Robert Allerton Parker, of New York. Only the first thirty-six pages are devoted to *Mea Culpa*. Why he should blame himself is not easy to understand. Destouches went to Russia in 1936, an avowed Communist, to study conditions at first hand and came back bitterly disillusioned. *Mea Culpa* is the story, terrifically told. It gives one the impression that the psychotic author has a guilt complex over the situation in Russia. The remaining five-sixths of the book is a translation of the author's doctorate address written in 1924, a dramatic story of the tragic efforts of Philip Ignaz Semmelweis to secure recognition of the contagiousness of puerperal fever, unsuccessfully carried on from 1846 to 1865, when Semmelweis died in an institution for the insane, the victim of a self-produced infection.

Destouches, or perhaps we should call him Céline since he has adopted that name, writes in the patois of the underworld of Paris, the argot of the criminal classes which is said to have been old even in the days of François Villon and which corresponds in a measure to our newer "crook lingo." This has made the task of the translator, Mr. Parker, exceedingly difficult and he has had the additional handicap of the layman in dealing with the occasional medical terms which have crept in. But on the whole he has done well, acknowledging freely his indebtedness to a qualified French collaborator.

G. C.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association

B. J. Branton, M. D.
L. H. Rutledge, M. D.

W. F. Braasch, M. D., Chairman

J. C. Michael, M. D.
A. N. Collins, M. D.

President's Message

AT THE Northwest Regional Conference held recently in Chicago, the general theme for discussion was: "Medical Care for All the People." The discussions were led by officers of the national, state and county societies. The consensus of opinion seemed quite well crystallized about the fact that the county must be the responsible unit for the care of the sick. Climatic conditions, the variable types of citizenship, economic conditions, and many other factors make it impossible to establish a plan for the medical care of all the people which would be applicable to all parts of the country. To a lesser degree the same holds true in attempting to formulate a state-wide plan. Of the eighty-seven counties in Minnesota, perhaps the same plan may be applicable to about one-third this number. Many are able to take care of their own indigent and other medical problems. Some are sparsely settled and financially low. It is necessary for the state to come to their rescue. To determine which counties should have outside assistance and just how much is no small task. Our State Board of Control and State Relief Department, in conjunction with the Local County Welfare Boards and local committees of the County Medical Societies, are doing excellent work in formulating workable plans for these various needy counties. To coördinate these various agencies a central authority is necessary. Our State Association has done well in this capacity. At our Regional Conference, seventeen states were represented. So far as I could ascertain, no state represented at this conference had a better set-up for the care of the sick than has Minnesota, and few have as good.

Our State Board of Health, Public Health Association and Medical Society have the co-operation of the state and federal relief groups in every move to improve the care of the needy

sick. We all acknowledge the need for improvement and all are striving for such improvement. In former years duplication of effort was confusing and wasteful. Today this seems to be eliminated to a high degree.

While all our various state and county organizations are doing their best to work in unison and care for the sick to their best ability, we hope we all may learn and improve our methods from our contact with those from other states and counties. A study of their various plans and experiences should help us in our attempts to formulate workable plans throughout the state.

To me one of the most attractive parts of the program put on in Chicago was the outline of the Health Program in the state of Indiana. Such a program means much work, but I believe it is worthwhile in making the public medically conscious. I hope some day we may have such a program in Minnesota.

J. M. HAYES, M.D.

New Call to Action

For several years the American Medical Association has been urging county and state medical associations to experiment with new plans for the care of the indigent and low income groups.

The result has been a considerable amount of healthy activity in many parts of the United States.

It was not the type of activity that catches the public eye or fires the public imagination, however, and it has clearly become desirable, now, for organized medicine to take action on a large scale. Furthermore, a nation-wide, organized effort on the part of organized medicine promises to be more effective, now, than ever before.

Thank you, Mr. Governor!

On January 28, 1938, the Honorable Elmer A. Benson, Governor of the State of Minnesota, announced the appointment of Dr. John E. Indihar of Chisholm, Minnesota, to the Minnesota State Board of Health for a three-year term. Dr. Indihar is a highly respected member of the dental profession practicing at Chisholm. He was born at Sparta Junction, Minnesota, and is thirty-eight years of age. Following graduation from high school at Gilbert, he received his degree in dentistry at Marquette University in 1923. Dr. Indihar is a member of the Duluth District Dental Society, the Minnesota State Dental Association and the American Dental Association. He succeeds a chiropractor on the Board of Health and we are sure that he will make a most welcome addition to the Board. Those who know him will attest to his energy, modesty and sincerity.

Indeed, Governor Benson, a splendid change and one entirely consistent with the principles that should guide the State Board of Health. At the same time Governor Benson announced the reappointment of Dr. William A. Brand of Redwood Falls and Dr. Nels G. Mortensen of Saint Paul to the Board of Health. For the entire medical profession we say, Thank You!

The action taken recently by the Board of Trustees calls first for a thorough study of the medical needs of their own communities on the part of all state and county medical societies. A comprehensive outline of the two phases which such a study must cover—the demand for services on the one hand, and the supply available—has already been sent to all State societies.

Time is Ripe

The time is ripe for a new study of medical services in the United States and it is right and proper that this study should be under medical auspices.

Several years have passed since the Committee on Costs of Medical Care made its report and times have greatly changed. The studies made recently by the United States Public Health Service on the amount of chronic illness in this country have filled in some parts of the

current health picture; but new and authoritative data are needed on the actual condition of medical services and the need for extended care.

The next step will be, of course, to work out some practical plan in every community where it may be needed, to meet that individual community need.

Acts of Congress and heavy appropriations are not necessary for practical action of this sort. For medical men this is the time and opportunity to show that medicine can and will make any needed adjustments that it may uncover without outside aid.

Council Will Act

The outline for the study, prepared by Dr. R. G. Leland, director of the Bureau of Medical Economics, will be presented shortly to the Council for decision as to Minnesota's participation in this nation-wide study.

Northwest Conference

The Northwest Regional Conference originated in Minnesota in 1927 when Dr. W. F. Braasch was president of the Minnesota State Medical Association and it was held in Saint Paul under the auspices of the Minnesota Association for many years.

At the meeting held February 12 in Chicago, President J. M. Hayes, Dr. Braasch and Mr. R. R. Rosell, executive secretary, represented the Association.

Following are some interesting highlights on public welfare work carried on by a few of the seventeen state societies participating. They furnish evidence of a fact that was strikingly evident to those who were present at the 1938 meeting: Organized Medicine has moved rapidly in the last few years along the road to efficient handling of relief and welfare problems that involve care of the sick in their own communities.

Preventing Disease

Indiana.—A general public health education program is carried on by all the county societies in the state, according to a definite schedule that changes monthly. For example, February was devoted to syphilis education; March is to be devoted to the pneumonia program; April to cancer. News stories sent out from the state

office follow the program throughout the state. Special talks, health exhibits, demonstrations, mark each campaign.

Roving Committee

Wisconsin.—As a result of last year's long fight in the legislature to defeat the Beirmiller bills (for sickness insurance, state subsidies, et cetera) the Wisconsin State Medical Society is now engaged in what is perhaps the most thoroughgoing study ever made in any state as to medical care, adequacy of facilities, costs. A roving committee, so-called, goes into each community, meets with representative groups including representatives of all leading service organizations, Rotary and Kiwanis clubs, churches, carefully studies the local situation, makes notes of findings. A permanent committee is left behind which will study the problem further and report to the state society. The committee is still assembling information and no reports have been issued to date. It will be remembered, in this connection, that the Wisconsin Society is also sending its executive secretary, Mr. George Crownhart, to Europe this spring to make a first-hand study of sickness insurance systems in European countries.

Rehabilitating Sick Men

West Virginia.—The West Virginia State Medical Society is carrying on a significant demonstration of the value in money to the state of the medical rehabilitation of otherwise unemployable relief clients. The society started with a trial of appropriation of \$1,000 to be used for the rehabilitation of ten men. This cost was determined on the basis of a survey by which they also showed to the state that it was costing an average of \$224 to maintain the same unemployables on relief. At the end of the first year the medical men returned each of the ten men to regular jobs. The accomplishment so impressed relief authorities of the state that a large appropriation is now set aside each year for the rehabilitation of unemployables. It is estimated that the state saved \$169,120 during the last year.

Cutting Red Tape

Oakland County, Michigan.—The Oakland County Medical Society has developed a working alliance with county relief authorities where-

by any relief client may apply at any time to the doctor of his choice, without any preliminary authorization whatever, for needed medical service. The procedure is this: the relief client calls the doctor or visits his office; the doctor gives him whatever care or advice may be immediately needed and signs the patient's own identification card; *subsequently*, within seven days from the date of the first visit, the doctor sends to the relief office a statement on a simple form as to the call, name and identification of the patient, diagnosis, need, if any, for further service. Further care is given as needed on the basis of a fee schedule determined by an advisory committee of the medical society and the medical director of the relief administration. Discipline of physicians who might chisel is the responsibility of the advisory committee. The plan has worked, with additions and notable developments, in Oakland County (population about 200,000, largest city, Pontiac) since 1934.

County Society Clinic

Sedgwick County, Wichita, Kansas.—The Sedgwick County Medical Society has formed a clinic for the handling of medical care for relief patients. A lump sum of \$500 is paid to the society for the service and all relief patients apply to the clinic for medical aid. The society also operates a credit bureau and collection agency for its members. Low income patients who are unable to pay regular fees are referred to the bureau, their needs and bills budgeted and the care administered at costs within their ability to pay.

Government Medicine

Statements frequently have been made to the effect that the government institutes postgraduate training for members of the panel in the countries where compulsory sickness insurance is in force.

In a recent issue of the *British Medical Journal* it was announced that arrangements had been made to give a course of postgraduate instruction to some forty-five members of the panel over a period of two weeks. One cannot help but compare this with the opportunities for graduate instruction available to members of the medical profession in this country,—and this under the spur of individual initiative.

There is a great variety of opportunities here. For instance, in Michigan practically all the doctors go to school at least two months out of a year. Instead of giving up their entire practice, the graduate lectures and demonstrations are brought to various parts of the state so that the physicians will have to sacrifice but two or three hours a day two or three times a week. So-called refresher courses are given by many state universities in regular centers over a period of a week or two. The annual meetings of the state, as well as national medical societies, are made centers for graduate education. There are many other agencies for graduate instruction, such as the College of Surgeons, the Inter-State Assembly, hospital clinics, beside the courses which are arranged by the various county societies in the larger medical centers. Opportunities are continually being increased so as to reach the majority of the practitioners.

Many of these activities are now being described in detail in the Economic Columns of *The Journal of the American Medical Association*.

One would hesitate to predict what might happen to these manifold opportunities if American medicine should ever be controlled by the state. There would be but little incentive to maintain the present facilities and those which might be developed undoubtedly would be restricted and stereotyped by governmental control. This is only one more of the calamities which would befall medicine if our socialistic friends had their way.

"Forewarnings"

(Monthly Editorial by the Medical Advisory Committee)

Four cases in four days, each with a potential warning to the members of our Association, were reviewed by the Medical Advisory Committee the first week in February.

1. A case of alleged unauthorized autopsy.

In no case should an autopsy be performed except by the duly constituted authority authorized by law to perform such autopsies unless written permission which has been signed by the next of kin and notarized or witnessed is in your hands.

2. A case of alleged negligence.

Never fail to examine a case thoroughly even though you do not feel it necessary. If you haven't time, make a future date or send the patient to someone else who has the time. If the patient will not do as you wish, refuse to treat him until he will. Better to lose the patient than to lose a malpractice suit.

3. A case of giving unauthorized information.

Information obtained from a patient should be kept confidential. There is no finer relationship than the patient-physician relationship. Lawyers and others are not entitled to information unless the patient signs the request. Be sure again that the request is notarized or witnessed. It may save you trouble.

4. A case where an assistant talked out of turn.

When cases are referred to associates or assistants for care, see that they are fully aware of their responsibility to you or to the surgeon who formerly treated the case. A derogatory word spoken by an unthinking or irresponsible assistant caused the last case reviewed.

If foresight is better than hindsight, then forewarning, if heeded, will save disaster in many a case. Take heed to the "mariner who watches the thin clouds and takes a reef in his sails, before the storm breaks."

Remember

Deductions for expenses incurred in attendance at medical meetings and in postgraduate study may now be made by physicians in making state income tax returns.

This new ruling made by the Minnesota Tax Commission brings the state regulations into conformity with federal income tax regulations in this matter. Physicians who have not yet made returns should remember this ruling.

"Sorry for Their Patients"

"I cannot understand why so few men attend their county and state medical society meetings. It is not because they are so busy, as the busiest doctors are always found where there is a chance to learn. After years of observation I have reached the conclusion that there are three kinds of physicians who don't attend meetings: the

person who has not the ability to plan his work so that he can have an evening for recreation at the meeting; second, the man who thinks he knows it all, has not read a new book since leaving school, and has no time for reading the journal or other publication; and third, the man who is afraid he might lose a patient should he leave his office. These three types form the fault finding group, complaining, but will not come to the meetings and put their shoulders to the wheel, clarify their visions, help remove the faults they see and become what is most needed by the society and always welcomed by its officers—a worker instead of a drone or complainer.

"Yes, the opportunity for the present-day doctor to be an up-to-date doctor is right at one's door, and I am not only sorry for those who are missing these opportunities, but for their patients."—*Pittsburgh Medical Bulletin*.

Minnesota State Board of Medical Examiners

Self-Styled Health Expert Loses in Supreme Court

Re State of Minnesota vs. Vivi Ann Mielke, also known as Vivi Ann Wyntor.

On February 4, 1938, the Supreme Court of Minnesota, in a unanimous decision, held that the above defendant, who represented herself in Minnesota as a health expert, had brought herself "squarely within the basic science law" by her conduct. The opinion of the Supreme Court, which is printed in full at the end of this article, was written by the Honorable Charles Loring, Associate Justice. The opinion is clear and concise and should go a long way to effectively demonstrate that quackery will not be tolerated in Minnesota through any such attempted evasion of the law.

Following the decision of the Supreme Court, the defendant appeared in the District Court of Ramsey County, and entered a plea of guilty on February 14, 1938, to the amended information charging her with practicing healing without a basic science certificate. The plea of guilty was entered before the Honorable Richard A. Walsh, Judge of the District Court, who, after hearing the facts and questioning the defendant, imposed a fine of \$100.00 or thirty days in the Saint Paul Workhouse. The fine was paid. The disposition of the case was recommended by the County Attorney's office of Ramsey County, and the Minnesota State Board of Medical Examiners because the defendant was also obliged to pay the expense of the appeal to the Supreme Court. Judge Walsh, in passing sentence, remarked that, in view of the Supreme Court's decision, the defendant had clearly violated the law; Judge Walsh also stated that the basic science law was enacted to protect the people against such things.

The defendant, who is twenty-five years of age, was arrested at the Lowry Hotel in Saint Paul, on April 23, 1937, following an investigation conducted by the State Board of Medical Examiners and the Saint Paul Police Department. At that time the defendant was

released upon \$500.00 bail, waived her preliminary hearing when arraigned in Municipal Court on April 24, and was held to the District Court, where she was arraigned on April 26. The case was continued to May 10, 1937, and reset for trial on May 18, on which date an amended information was filed setting forth the charge in considerable detail. A demurrer was interposed by the defendant and on July 12, 1937, the Honorable Richard D. O'Brien, Judge of the District Court, made an order overruling the demurrer and certified the case to the Supreme Court of Minnesota for a decision as to whether or not the amended information charged the defendant with a public offense. The information alleged that the defendant had advertised herself as an assistant and staff lecturer for one R. A. Richardson, an osteopath of Kansas City, Missouri, who holds no license to practice any form of healing in the State of Minnesota. It also charged her with giving free lectures at the Lowry Hotel in Saint Paul, following which she gave a lecture course on health matters for which she charged a fee of \$5.50; that during these lectures she advertised certain products including pills, tablets and other preparations which she had for sale. These concoctions were represented as being used in the treatment of anemia, thyroid disturbances and a multitude of other conditions.

The defendant, at the time of her arrest, maintained an office in the Lyceum Building at Duluth. She also operated in Virginia, Hibbing and St. Cloud. She admitted that she had never studied medicine and that her only training for this type of work was supplied by Richardson.

The defendant was represented by George H. Lomen, State Senator from Eveleth, Minnesota, who devoted a great deal of his time and argument in a futile attempt to divert attention from the real issue by attacking the medical profession. The State was represented by the Honorable William S. Ervin, Attorney General of Minnesota; Mr. Roy C. Frank, Assistant Attorney General; Mr. M. F. Kinkead, County Attorney of Ramsey County, and his assistants, Mr. James F. Lynch and Mr. Horace R. Hansen.

No. 4 Ramsey County Loring, J.
State of Minnesota, Plaintiff,
31501 vs.
Vivi Ann Mielke, also known as
Vivi Ann Wyntor, Defendant.
Endorsed:
Filed February 4, 1938.
Russell O. Gunderson, Clerk.
Minn. Supreme Court.

SYLLABUS

An information examined and found to charge defendant with practicing healing without a certificate under the Basic Science Act. The requirements of that act are germane to the protection of the public as applied to the acts charged against the defendant.

The question certified to us is properly answered in the affirmative.

OPINION

LORING, Justice.
The trial court has certified to this court the question: "Does the amended information as filed charge a public offense under the Basic Science Act of the State of Minnesota as set out in Section 5705 of Mason's Minnesota Statutes for the year 1927?" The amended information charges the defendant with practicing healing as defined by law without a valid existing certificate of registration in the basic sciences. As amended the information charges the defendant with advertising herself as an assistant and staff lecturer for Dr. R. A. Richardson of Kansas City, and that she would give free daily lectures commencing April 13, 1937, to and including April 15 of that year; that she gave the lectures at the Lowry Hotel in Saint Paul, and during the lectures solicited women present to attend a lecture course which would follow immediately, for which a fee was charged; that a number of women attended and paid the fee, and during the lectures certain products or

concoctions were described and their uses and values discussed and certain circulars were distributed by and under the direction of the defendant, which circulars further described such products; that during the lectures it was announced that she had such products for sale, and she suggested and recommended their purchase by her hearers, who actually bought them from her at the Lowry Hotel; that from these sales she derived a commission of 55 per cent, the remainder going to Dr. Richardson, who was an osteopath holding no license to practice healing in the state of Minnesota; that one of the paragraphs in the circulars distributed by her was entitled: "How to Improve Your Health and Personal Appearance," and that it stated further:

"An anemia condition of the blood may mean either a deficiency of the blood itself or a deficiency of its red blood corpuscles.

"Recent scientific discoveries have proved the effectiveness of powdered bone marrow and spleen in the symptomatic treatment of anemia. This treatment offers greater promise of success than previous treatments, and it is endorsed by physicians.

"The effect of red bone marrow and spleen is shown in several ways. It has been found that these substances increase the formation of red blood corpuscles and their hemoglobin content. They also serve as an increased resistance to the process of hemolysis. By this process the hemoglobin or iron content of the blood is separated from the corpuscles and appears in the blood serum. Red bone marrow and spleen has a tendency to make the blood coagulate more quickly, and in this connection it has been used very effectively in the treatment of abnormally profuse menstruation."

She offered for sale tablets claimed to contain red bone marrow and spleen and labeled: "Useful in Secondary Anemia." Circulars which she distributed contained the following paragraphs:

"Women may become excessively fat or unusually thin, or have other physical disturbances. For instance, the young woman whose female organs are not functioning properly, and whose menstrual periods are irregular, practically always has a deficiency of glandular secretions. The thyroid gland as well as the ovarian glands, is practically always involved.

"The reason we feel so certain that both the thyroid and ovarian glands are concerned is because when thyroid and ovarian substances are supplied, the condition invariably improves. Not only does the patient feel better, but she is more alive and alert, and her complexion, the light in her eyes, and the cheerfulness of her expression, all prove that the very thing she needed was glandular food, or female hormones."

Defendant is also charged with having sold female hormone tablets in connection with the lecture.

The Basic Science Law, Sec. 5705-1 et seq., Mason Minn. St., forbids the practice of healing without first having obtained a certificate of having passed an examination by the state board of examiners in the basic sciences. By the terms of the act, the basic sciences are defined to include the following: anatomy, physiology, pathology, bacteriology, hygiene, and chemistry insofar as the same relates to the human system or mind as generally treated in each or all of said subjects. The practice of healing is defined by the act as including any persons who shall in any manner for fee, gift, compensation or reward, or in expectation thereof, engage in the diagnosis, analysis, treatment, correction or cure of any disease, injury, defect, deformity, infirmity, ailment or affliction of human beings or who for any fee suggests, recommends or prescribes any medicine or cure thereof.

The defendant does not attack the constitutionality of the basic science law, but asserts that as it applies to her or to the acts charged against her it infringes upon her constitutional rights and that there is no relation between the requirements of the basic science law and the protection of the public as applied to her situation.

With the defendant's contention we cannot agree. It is essential to the public health and safety that persons who, for compensation, are suggesting, recommending, or prescribing medicine or treatment for the correction or cure of human ailments have a basic understanding of the subjects required by the basic science law. In our opinion it is within the police power of the state to so require. According to the information lodged against her, the defendant induced women to come to lectures for which she charged a fee and for those who had menstrual troubles she suggested and recommended tablets which she had for sale for correction and cure of their affliction. It is our view that her conduct came squarely within the basic science law and that the requirements of that law are germane to the safety and health of the public in the treatment

of such ailments as those for which she sold and recommended her tablets and medicines. Such being the case, no constitutional right of the defendant is infringed upon.

It is our opinion that the question certified to us by the trial court should be answered in the affirmative and that the court properly overruled the demurrer to the information.

Olivia Chiropractor Pleads Guilty

State of Minnesota vs. Hans C. Hanson

On January 29, 1938, Hans C. Hanson, sixty-two years of age, entered a plea of guilty to an information charging him with practicing healing without a basic science certificate. Hanson's plea of guilty was entered before the Honorable G. E. Qvale, Judge of the District Court at Willmar. The Court, upon being advised that Hanson had closed his office and taken his signs, sentenced the defendant to pay a fine of \$50.00 plus court costs of \$11.00.

The investigation made by the Minnesota State Board of Medical Examiners disclosed that Hanson opened an office at Olivia in October, 1937, for the practice of chiropractic. Hanson has no license to practice any form of healing in the State of Minnesota or elsewhere. He had a diploma on his office wall dated December 5, 1914, from the Palmer School at Davenport, Iowa. He admitted, however, that he had only taken a one-year course to obtain the diploma and that his preliminary education was limited to the eighth grade. He stated that after his graduation from the Palmer School, he practiced chiropractic for fifteen months at Sydney, Montana, and returned to his home at Hutchinson, Minnesota. He also stated that in 1919, when the Minnesota chiropractic law was passed, he was farming. Shortly before opening his office at Olivia, Hanson stated that he took a one month postgraduate course at the National College in Chicago. Hanson used no pretext about practicing, having the chiropractic sign on his door and also one on the outside of the building where he was located. He also ran a card in the *Olivia Times*.

The Medical Board wishes to acknowledge fine cooperation from Mr. Russell L. Frazee, County Attorney of Renville County.

The Zinc Sulfate Spray for the Prevention of Poliomyelitis

The successful use of a zinc sulfate spray in the prevention of experimental poliomyelitis in monkeys by Armstrong, Sabin, Schultz and their co-workers has stimulated much interest in its effectiveness as a preventive of the disease in human beings. Schultz demonstrated at Stanford University that in the experimental infection a solution containing 1 per cent of zinc sulfate, 1 per cent of pontocaine and 0.5 per cent of sodium chloride in distilled water is most effective in the monkey. The use of this technic in the human being has been too variable and uncontrolled to permit even an approximate estimate of its value. Dr. J. C. Geiger, the director of public health of San Francisco, and his distinguished committee have recommended that the use of this spray must be strictly limited until the proper technic has been worked out. (J.A.M.A., Sept. 18, 1937, p. 958)

OF GENERAL INTEREST

Dr. W. A. Brand of Redwood Falls has been reappointed to the State Board of Health.

* * *

Dr. Walter P. Gardner has assumed charge as superintendent of the Anoka State Hospital.

* * *

Dr. R. R. Hendrickson of Wadena has been named resident physician of the St. Cloud reformatory, effective February 1.

* * *

Dr. G. H. Olds of Waseca was elected chairman of the Waseca County District Scout Committee for 1938 at the district annual meeting held on January 27.

* * *

Dr. E. H. Rynearson of Rochester was elected chairman of the Zumbro Valley District Boy Scout Committee at the recent annual meeting of the group.

* * *

Dr. Z. E. House, who recently retired from government service, has returned to Cass Lake after a three months' vacation in Florida, and will enter private practice.

* * *

Dr. Walter S. Neff, who has been practicing medicine in Boston, has joined the staff of the Lenont-Peterson Clinic, Virginia, Minnesota, as head of the division of internal medicine.

* * *

Dr. Olga S. Hansen of Minneapolis spoke on "The Medical Profession as a Career for Women" at a lecture-tea for women students of Gustavus Adolphus College at St. Peter recently.

* * *

Dr. Leo Hilger of Saint Paul was elected president of the advisory board of St. Joseph's Hospital at its annual meeting, succeeding Dr. W. C. Carroll. Dr. William Kennedy was named to the board for a five-year term.

* * *

Dr. Joseph F. Malloy, associated with the Bratrud Clinic of Thief River Falls, was recently appointed Soo Line surgeon. Dr. Edward Bratrud also will continue to serve as surgeon for the company as he has for a number of years.

* * *

Dr. and Mrs. A. R. Ellingson of Detroit Lakes have gone to New Orleans, where Dr. Ellingson is taking a six weeks' course in surgery and x-ray diagnosis at the University of Tulane. They expect to return to Detroit Lakes about April 1.

* * *

Dr. Henry Porter Johnson of Fairmont celebrated his eighty-third birthday on February 3. Dr. Johnson has practiced medicine for fifty-nine years, thirty-eight

of which have been spent in Fairmont, and is still actively engaged in the practice of his profession.

* * *

A special program of lectures and demonstrations in surgery and medicine will be held in Rochester under the direction of The Mayo Foundation from March 28 to April 1, inclusive. Symposia on gastric diseases, diseases of children, cardiology, urology and backache, and conferences on roentgen, radium and physical therapy will be included. Visiting physicians are invited to attend.

* * *

The Foundation Prize of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, consisting of \$500, is open to internes, residents, graduate students and doctors of medicine practicing or teaching the specialty. Manuscripts limited to 5,000 words should be submitted before June 1, 1938, to the secretary, Dr. James R. Bloss, 418 Eleventh Street, Huntington, West Virginia.

* * *

Dr. Paul O'Leary and Dr. G. B. New of Rochester, attended the International Postgraduate Medical Assembly of Southwest Texas in San Antonio in January. Dr. O'Leary spoke on the treatment of syphilis and dermatological conditions. Dr. New also attended the meeting of American Association of Plastic Surgeons in Dallas and Houston, and a sectional meeting of the American College of Surgeons in Houston. He appeared on the program at each of these meetings.

* * *

Dr. J. C. Litzberg, Professor of Obstetrics and Gynecology at the University of Minnesota, presented a paper on "What is Good Care for Mothers and Babies" before the Conference on Better Care for Mothers and Babies held by the Children's Bureau of the United States Department of Labor, in Washington, January 17, 1938. Others from Minnesota who attended were Dr. Ruth Boynton, Director of the Student Health Service, University of Minnesota, Dr. E. C. Hartley, Clinical Instructor of Obstetrics and Gynecology, University of Minnesota, and Dr. A. J. Chesley, secretary of the Minnesota State Board of Health.

* * *

The Third Annual Postgraduate Institute, offering an intensive and interesting study of the Diseases of the Digestive Tract, will be conducted by The Philadelphia County Medical Society from March 28 to April 1, inclusive. The program to be held in the Bellevue-Stratford Hotel, Philadelphia, has been designed to meet the needs of all members of the profession, but particularly those in general practice.

Physicians from fourteen states having attended last year's institute, an invitation to attend the 1938

OF GENERAL INTEREST

session has been extended to the members of all county societies. The only charge is a \$5.00 registration fee to cover the Institute's expenses. Additional information may be secured from your County Society or from the Philadelphia County Medical Society, 21st and Spruce Streets, Philadelphia, Pa.

* * *

The medical staff of the Menninger Clinic will conduct its fourth annual Postgraduate Course on *Neuropsychiatry in General Practice*, April 25 to 30, inclusive, at the Menninger Clinic, Topeka, Kansas. The course this year will include a brief introduction to the fields of neurology and psychiatry and a specific application of this knowledge to the large group of cases of psychoneuroses, psychoses and psychogenic and neurological disorders which every physician meets in his daily practice. Suggestions made by those who took the course last year have been embodied in this year's program in order to make it applicable to the most common practical problems of the physician.

As in previous years, several guest speakers, prominent in the fields of neurology and psychiatry, will appear at the evening sessions of the course.

* * *

The American Physiotherapy Association has announced a Vocational Service in providing trained physiotherapists for hospital and office positions. The Association was organized very soon after the close of the World War, the charter members being former Reconstruction Aides in service. Since then the membership has increased to more than 800. The present requirements for membership are: 1. One year's practice in physical therapy within two years of graduation from an approved school of physical therapy. 2. An approved course in physical therapy of not less than nine months, following graduation from a school of nursing or physical education which meets the requirements of the individual states. These requirements have been approved by the Council on Medical Education and Hospitals of the American Medical Association. The object in having these qualifications for membership is to provide for the hospitals, schools for crippled children, and offices of physicians, trained physiotherapists who are able to follow the physicians' orders intelligently and thoroughly.

One of the purposes of the American Physiotherapy Association is to "coöperate with and work only under the prescription of members of the medical profession."

Further information may be obtained by writing to Miss Edith Monro, 483 Beacon Street, Boston, Massachusetts.

* * *

The A.M.A. Convention Tour

According to latest reports physicians and their families are evincing a keen interest in the arrangements made for a convention tour of America en route to and returning from the San Francisco convention.

The "See America" movement by deluxe special trains is endorsed by approximately twenty-five State

medical societies. It presents an opportunity for members and their families to join with their colleagues from other states, and enjoy the facilities and service of deluxe special trains, and at the same time visit the many scenic attractions of our western states.

Many physicians, completely immersed in their practices, have hesitated to take such an extended vacation heretofore but now the fact of the A.M.A. convention and the attractiveness and economical features of this travel program have brought such a trip within the realm of desirable possibilities.

The all-inclusive price is unusually low because of the coöperation of so many medical societies. An attractive folder, describing these travel arrangements, may be obtained through the secretary's office or the Transportation Agents, The American Express Travel Service, 723 Marquette Avenue, Minneapolis, Minnesota.

* * *

State Meeting

The fine program arranged for the 85th Annual Meeting of the Minnesota State Medical Association at the Hotel Duluth in Duluth is prompting several special societies to hold their own annual gatherings in conjunction with the state meeting.

Dates for the assembly are June 29 and 30 and July 1.

The Northwest Pediatric Society, which is bringing one of the distinguished speakers scheduled for the regular program, will adopt the program of the pediatric session for its own annual session. Dr. C. Anderson Aldrich of Winnetka, Illinois, is the speaker to be sponsored by the pediatricians. His subject will be, "Some Practical Points in the Management of Nephritic Children."

Other special societies and sectional groups who will finance speakers for this meeting include the Society of Internal Medicine, the Radiological Society and the Northern Minnesota Medical Association. Their speakers are respectively Dr. E. K. Marshall of Johns Hopkins, Dr. Hollis Potter of Chicago and Dr. Philip Lewin of Chicago. The Minnesota Society of Ophthalmology and Otolaryngology was of assistance in securing Dr. Edward Jackson of Denver for the program. Dr. Roland Cron of Milwaukee, Dr. Irvin Abell of Louisville, Kentucky, president-elect of the American Medical Association, Dr. Carl Meyer of Chicago, and Dr. Howard Haggard, noted writer and lecturer of Yale, were secured by the Committee on Scientific Assembly.

The completed program provides for extensive exhibits and demonstrations during morning and afternoon exhibit periods. Otherwise all sessions will be held in one lecture hall, the ballroom of the hotel, with guest speakers as features of each morning and afternoon session.

Doctor Haggard will talk to the doctors at the banquet Thursday night and he will also be principal speaker at a meeting to which the public will be invited at the Lyceum Theater in Duluth.

MINNESOTA MEDICINE

HOSPITAL NEWS

Dr. C. H. Schroder of Duluth was chosen chief of staff of St. Luke's Hospital at the recent annual meeting of the hospital staff.

Other staff officers named are: Dr. A. G. Athens, vice-chief of staff; Dr. S. H. Boyer, Jr., secretary; Dr. W. N. Graves, chief of surgery; Dr. R. L. Nelson, chief of medicine; Dr. R. J. Moe, chief of obstetrics; Dr. M. F. Fellows, chief of eye, ear, nose, and throat; Dr. R. E. Nutting, chief of pediatrics; Dr. A. H. Wells, chief of staff, laboratory section, and Dr. R. M. Mayne, chief of staff, x-ray section.

* * *

The Minnesota Association of Hospital, Medical and Institution Librarians held a luncheon meeting Saturday, February 5, 1938, at the Women's City Club in Saint Paul with thirty-three people present. Elizabeth Jensen of the St. Peter State Hospital and Mildred Schumacher of the Rochester State Hospital reported on the usability of the books of Temple Bailey and Mary Roberts Rhinehart respectively. Mary Heenan of the School for the Blind at Faribault described her work and dwelt in some detail upon the "Talking Books" and the government arrangements for the use of them by the blind people in this district. Mrs. Stella H. Amass, Director of Psychiatric Nursing in Minnesota, spoke upon the various types of patients to be found in hospitals and institutions, using as her title "The Librarian's Approach to the Patient." The next meeting will be at the time of the meeting of the Minnesota Hospital Association in May.

* * *

Drs. Edward Schons and J. P. Medelman announce the completion of the installation of a 1,200,000-volt, constant potential roentgen therapy apparatus which took nearly two years to construct in the Charles T. Miller Hospital of Saint Paul. This equipment was built especially for the hospital, and is considered the largest and the most advanced of its kind. It will be used primarily for the more adequate and efficient treatment of deep-seated tumors. The high voltage and filtration used will yield a radiation of high quality and penetrating power, permitting homogeneous irradiation of deeply situated tumors. Lower voltage equipment has also been installed and will be used as heretofore where that type of irradiation is indicated, as will also radium.

The Charles T. Miller Hospital has constructed a special building and made alterations in the adjacent wing, in order to accommodate the equipment and provide for needs incidental to the treatment of patients. The giant steel and porcelain tube is surrounded by lead 4 inches thick to prevent escape of radiation into the treatment room except through the treatment portals. Adequate protection of the personnel has been provided for with concrete walls 3 feet thick. Provision has been made for measuring equipment, indicating the quality and quantity of the radiation used.

MARCH, 1938

In Memoriam

De Witt Clinton Jones

1868-1937

DR. D. C. JONES, Saint Paul, was born January 19, 1868, in Saint Paul, his parents having been early settlers. His aunt, Cleopatra Irvine, born in 1844, is said to have been the first white female child born in Saint Paul, at which time Minnesota was part of Wisconsin Territory.

Dr. Jones received his primary education in Saint Paul, and later attended De Vaux University, Toronto. In 1890 he was granted a degree in midwifery by the Toronto General Hospital, and the following year passed written examinations entitling him to diplomas from the Toronto, Victoria and Queen's Universities and the Trinity Medical College.

Returning to Saint Paul, Dr. Jones served his internship at the City and County Hospital in 1891 and 1892. Granted his license to practice in Minnesota in 1892, he opened an office at Seven Corners.

During the Spanish-American war, Dr. Jones served as contract surgeon at Fort Snelling and in 1911 was made First Lieutenant in the Medical Reserve.

For ten years he was coroner of Ramsey County. During this period he organized the Minnesota Coroners Association and was instrumental in revising laws relating to the duties of coroners.

Always active in politics, Dr. Jones was a founder and organizer, in 1895, of the first Democratic Club in Saint Paul. He was a member of the Ramsey County Medical Society, the Minnesota State and American Medical Associations. He was a member of the Masonic order, the Modern Woodmen and the Odd Fellows. He was also a member of the Episcopal Church. At Norwood, Minnesota, on August 22, 1908, Dr. Jones married Fannie Trocke, a well known business woman of Saint Paul. He is survived by his widow.

John Thomas Rogers

1867-1938

DR. JOHN T. ROGERS, for many years one of the outstanding surgeons of Saint Paul, died very suddenly at his home on January 2, 1938, at the age of seventy.

Born in Woodford County, Kentucky, July 18, 1867, of Kentucky stock, he received his academic education at Transylvania University. He moved to Saint Paul with his parents in 1886, and was temporarily employed in a haberdashery shop soon after his arrival. His ambition to become a doctor was made possible by his acquaintance with Dr. Charles A. Wheaton, who was then one of the leading surgeons in Saint Paul. Employment in Dr. Wheaton's office enabled him to attend the medical school at the University of Minnesota and during his student days he assisted Dr. Wheaton at emergency operations performed in out-

IN MEMORIAM

lying districts. Following his graduation from the University Medical School in 1890, Dr. Rogers continued his association with Dr. Wheaton and became what might have been termed a resident surgeon at the City and County Hospital in Saint Paul.

Upon Dr. Wheaton's retirement from practice in 1906, Dr. Rogers became associated with Dr. A. R. Colvin until 1915, when this partnership was dissolved and he took Dr. Harry B. Zimmermann into partnership.

Dr. Rogers was largely responsible for persuading Mrs. Charles T. Miller, the widow of Charles T. Miller of Saint Paul, to donate funds for the construction of a hospital in memory of her husband. Permission was obtained during our participation in the World War to begin construction of the hospital now known as the **Charles T. Miller Hospital** with the idea that the hospital would, upon completion, be temporarily used by the United States government. The government never used the hospital and it was necessary to obtain additional funds for equipment. This was accomplished partly by the assistance of a group of St. Paul physicians who formed the Miller Clinic in 1919. Dr. Rogers was a member of this clinic group until it dissolved in 1934. During the early days Dr. Rogers did most of his work at St. Luke's Hospital, being frequently called to operate in outlying cities. With the establishment of the Miller Hospital he became chairman of the Board of Trustees and Chief of Staff of the hospital, positions he held until his death.

Dr. Rogers was a younger member of a group of surgeons who, in the eighties and nineties, made Saint Paul a surgical center of the Northwest. A most lovable character, who inspired immediate confidence, Dr. Rogers enjoyed an enviable reputation and practice. A student rather than a scholar, he did not make numerous contributions to surgical literature. He had an almost uncanny ability to absorb minute details of operative technic by observation. He made many visits to clinics in this country and abroad for self-betterment.

During Dr. Rogers' more than forty-seven years of practice, he served as president of the Minnesota Academy of Medicine in 1901 and as president of the Minnesota State Medical Association in 1915. He was also a member of the American College of Surgeons and of the Ramsey County Medical Society and the Minnesota State and American Medical Associations.

Dr. Rogers is survived by his daughter Mrs. Jerome Helpert of Saint Paul, having been preceded in death a few years ago by his wife.

Philemon Roy

1869-1938

DR. PHILEMON ROY, Saint Paul, died of coronary disease, January 21, 1938, while on vacation in McAllan, Texas.

Dr. Roy was born at St. Anaclet, Quebec, December 13, 1869, of French parents, the third of a family of fifteen children. He received his primary education at the College of Remouski in the Province of

Quebec. He received his M.D. from the University of Minnesota in 1896.

After practicing a few years at Pierz, Minnesota, he took three years of postgraduate study in Paris, Vienna and Berlin. Upon returning to the United States he served one year as assistant to the chief surgeon in the French Hospital at San Francisco. In 1902 he began general practice in Saint Paul with offices in the Grand Opera House Building, in 1919 moving to the Hamm Building.

In 1907, Dr. Roy married Ada Cheverton of Rich Hill, Missouri. He is survived by his widow, a daughter Germaine, and a son, Dr. Philemon C. Roy, who has been associated with him the past two years.

Dr. Roy was a member of the Elks, the Maccabees, L'Union Francois, the Woodmen of the World and a life member of the Saint Paul Athletic Club. He was a member of the medical staffs of Bethesda, St. Joseph's and St. John's Hospitals. He was a member of the Ramsey County Medical Society, of which he was vice president in 1937, and of the Minnesota State and American Medical Associations.

Gonorrhea and Sulfanilamide

In view of the widespread interest in sulfanilamide and related compounds in the treatment of gonorrhea, the work of Johnson and Pepper (Weekly Roster and M. Digest, 33:465, (Dec. 11) 1937) on this subject is of interest. Twenty-four patients were given a benzyl sulfanilamide (*p*-benzylamino-benzene-sulfonamide), a drug as yet not on the market in this country, and seventy-five were given sulfanilamide (thirteen were given courses of both drugs). Of the twenty-four patients given this benzyl sulfanilamide, fourteen were treated for ten consecutive days with a minimum ten-day dosage of 600 grains. Only two of the entire group seemed to be improved. Of the seventy-five patients given oral daily divided doses of sulfanilamide, sixty-four were seen sufficiently long to analyze the results. Of this group more than half represented failures, based on an arbitrary ten-day standard. Fifty-five per cent of the sulfanilamide group and 50 per cent of the benzyl sulfanilamide group showed toxic symptoms. As a result of the somewhat disappointing observations the authors feel this type of therapy should not be employed in the routine treatment of outpatient gonorrhea. This work represents an additional argument for the careful administration of this group of drugs, since they appear to be of considerable value in some cases of the disease. (Jour. A.M.A., Jan. 1, 1938, p. 51.)

Crystalline Vitamin A.

The actual isolation of vitamin A in crystalline form appeared desirable chiefly for definite confirmation of the mass of circumstantial evidence pointing to its actual chemical configuration. This isolation has now been attained as a result of a series of noteworthy investigations by Holmes and Corbert at Oberlin College. By the use of purified solvents, low temperatures and special technical precautions, it has been possible to isolate the vitamin in crystalline form from the liver oils of three different species of fish. Biologic assay indicates that the crystalline preparation has a value of approximately 3,000,000 international units per grain. The molecular weight determinations and elementary analyses of the compound correspond to a formula already suggested for the vitamin. Thus, a dietary essential which has been known for a quarter of a century has finally been obtained in a crystalline, probably pure, form. (Jour. A.M.A., Dec. 11, 1937, p. 192.)

MINNESOTA MEDICINE

REPORTS and ANNOUNCEMENTS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The general oral, clinical and pathological examinations for all candidates (Groups A and B) will be conducted by the entire Board, meeting in San Francisco, California, on June 13 and 14, 1938, immediately prior to the meeting of the American Medical Association.

Application for admission to the June 1938 Group A examinations must be on an official form and filed in the Secretary's Office before April 1, 1938.

The annual informal Dinner and General Meeting of the Board will be held at the Palace Hotel, San Francisco, on Wednesday evening, June 15, 1938, at seven o'clock. Dr. William D. Cutter, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, will be the guest speaker, and the Diplomates certified at the preceding days' examinations will be introduced individually. All Diplomates are invited to attend the dinner meeting, and to bring as guests their wives and any persons interested in the work of the Board.

For further information and application blanks address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pennsylvania.

AMERICAN COLLEGE OF SURGEONS MID-WEST SECTIONAL MEETING

The Mid-West Sectional Meeting of the American College of Surgeons, including the states of Wisconsin, Minnesota, Iowa, Illinois, and Upper Michigan, will be held in Milwaukee, Wisconsin, on March 29, 30, and 31. The headquarters will be at the Schroeder Hotel. A most active Committee on Local Arrangements, headed by Dr. Carl W. Eberbach, is making excellent plans for this meeting. There will be an exceptionally interesting program consisting of clinics, scientific sessions, hospital conferences, medical motion pictures, and other features during the meeting. A visiting group of ten or twelve outstanding surgeons will be present to participate in this program.

The three-day session will be devoted to clinics, conferences and the inspection of scientific exhibits.

This meeting will be of interest not only to Fellows of the College but to the medical profession at large, as well as to hospital trustees, superintendents, nurses, and hospital personnel. Members of State Medical Associations are most cordially invited to attend. There will be no registration fee.

ASSOCIATION OF MILITARY SURGEONS

The Association of Military Surgeons of the United States will meet in Rochester for its annual convention October 13, 14 and 15, 1938. Dr. F. L. Smith of Rochester, a member of the Association, has been ap-

pointed by the Mayo Foundation to be chairman of local arrangements.

Headquarters of the Association are in the Army Medical Museum in Washington, D. C., with Major General H. L. Gilchrist, United States Army, retired, acting as national secretary.

It is expected that approximately 500 persons will attend the convention. Programs for the meetings usually include physicians from foreign countries and officials of the Army and Navy departments.

UPPER MISSISSIPPI SOCIETY

The following officers were elected at the annual meeting of the Upper Mississippi Medical Society, January 29, at Brainerd, Minnesota:

President.....Dr. H. L. Lamb, Little Falls
First Vice PresidentDr. Z. E. Kerlan, Aitkin
Second Vice PresidentDr. O. Ringle, Walker
SecretaryDr. G. I. Badeaux, Brainerd

WASHINGTON COUNTY

At the regular meeting of the Washington County Medical Society, February 8, two county commissioners and S. E. Gilkey, M.D., Medical Advisor to the State Relief Administration, met with us to discuss the various problems of relief.

The county commissioners were asked to state their position, inasmuch as there had been some dissatisfaction, which they did briefly. The doctors presented their problems and difficulties. The commissioners asked for questions—which were not slow in coming. After the pros and cons were gone over, it was evident that some progress toward a better understanding was undoubtedly made. After the county commissioners left, Doctor Gilkey analyzed the situation from the State Relief Administration's point of view.

Viosterol and Psoriasis

Cedar and Zon (Pub. Health Rep., 52:1580, (Nov. 5) 1937) administered massive doses of viosterol without local treatment of the lesions, dietary adjustment or any other therapeutic measure. A series of fifteen patients from 30 to 50 years of age with chronic widespread psoriasis were given from 300,000 to 400,000 units of vitamin D as viosterol. Eleven of the fifteen subjects showed complete involution of the psoriasis within six to twelve weeks' time. At the end of the period of treatment, three patients showed incipient symptoms of excessive vitamin D dosage. All the subjects exhibited an elevation in the level of blood calcium. There was a recurrence in some of the patients, though the degree of severity was much less than originally observed. Although the proposed treatment would appear to be safe, the authors suggest not only that there may be a smaller effective dose of viosterol but also that certain accompanying products of the irradiation of the ergosterol may be the potent factor. (Jour. A.M.A., Jan. 8, 1938, p. 133.)

PROCEEDINGS of the MINNESOTA ACADEMY of MEDICINE

Meeting of December 8, 1937

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 8, 1937. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 by the president, Dr. E. M. Jones.

There were forty-nine members present.

Minutes of the November meeting were read and approved as read.

The following officers were elected for the year 1938:

President.....R. T. LaVake, Minneapolis
Vice President.....Carl B. Drake, St. Paul
Secretary-Treasurer.....A. G. Schultze (relected)

The scientific program consisted of a symposium on Syphilis, and the following papers were presented:

1. Syphilis as a Social Problem....Dr. S. E. Sweitzer
2. Immunobiology of Syphilis....Dr. H. E. Michelson
3. Primary SyphilisDr. John Butler
4. Visceral Syphilis.....Dr. H. L. Ulrich
5. Asymptomatic Neurosyphilis.....Dr. Paul O'Leary
6. Syphilis as Seen in the Human Clinic Thirty-five Years AgoDr. Frank Wright

SYPHILIS AS A SOCIAL PROBLEM*

S. E. SWEITZER, M.D.
Minneapolis

It may seem superfluous to discuss syphilis as a social problem before a medical group, but recently Dr. Thomas Parran, Surgeon General of the United States Public Health Service, started a campaign against syphilis and the social diseases and has asked for coöperation from the various states. Here in Minnesota the President of the State Medical Society appointed a committee to coöperate in this work with the United States Public Health Service.

The difficulty of the control of a disease like syphilis can be shown by the success that we have in this country in eradicating smallpox. Van Etten¹ in a recent article mentions that we still have 40,000 cases of smallpox annually and this is a preventable disease. Vaccination and revaccination could eradicate it in a few years. We have no vaccine for syphilis and must endeavor to work on different lines. No one will deny that syphilis presents a tremendous problem and an endeavor will be made to examine this problem and to suggest how we can aid here in Minnesota.

With the publicity given the Surgeon General's attack on syphilis it has become popular to mention this disease in the newspapers and magazines and over the radio. For a time the public may become syphilis

*From the Department of Dermatology and Syphilology, Minneapolis General Hospital, Dr. S. E. Sweitzer, Chief.

minded but a warning must be given in regard to syphilis control, for when the fanfare of publicity ceases, any permanent and effective control of the disease must be accomplished by steady and continuous efforts of the medical profession.

From reading many of these news and magazine articles and from some of the statements made by men interested in the subject, one might assume that syphilis is on the increase. Let us see what has happened here in Minnesota in regard to the incidence of syphilis.

The first concerted attack upon syphilis was as a war measure. Minnesota was up among the leaders at that time and after the War this anti-syphilis campaign never was dropped. In most states, due to lack of funds or other causes, the war on syphilis was allowed either to be dropped entirely or was greatly limited in scope. As a result of our efforts here there has been a steady decrease in the incidence of syphilis in Minnesota. Many of you have read articles recently in which the incidence of syphilis is given as high as 10 per cent of the population. This is not true in Minnesota.

The following table will show a steady decrease from a high in 1925. The year 1918, being the first year, of course did not show many cases reported.

TABLE I. VENEREAL DISEASE CASE REPORTS—
State Department of Health, Division of Preventable Diseases
Minnesota—1918-1936

Year	Syphilis
1918	1801
1919	3551
1920	4422
1921	4814
1922	4291
1923	4779
1924	4809
1925	5147
1926	4871
1927	4938
1928	4438
1929	3983
1930	4104
1931	4199
1932	4033
1933	3824
1934	4071
1935	4224
1936	3379

The latest comparison is shown in Table II, where there is a slight increase this year in reported cases. This is more than likely due to the recently inaugurated campaign against syphilis with its attendant publicity. As a result, while in the first half of 1936 there were 39,713 Wassermanns sent in, in the same period of 1937 there were 50,570 sent in. No wonder a few more cases were discovered and most of these were from Minneapolis.

Dr. H. G. Irvine, in a personal communication, stated that in 1936 out of over 83,000 Wassermanns only about 6 per cent were positive. Diehl¹ over a two-year

period of observation of 5,000 students at the University of Minnesota was able to find only ten cases of syphilis.

TABLE II. VENEREAL DISEASE—CASE REPORTS
First Two Quarters 1936

State	Syphilis		Total
	Minneapolis	Duluth	
1089	466	161	1716
State	First Two Quarters 1937		Total
	Minneapolis	Duluth	
1103	513	138	1754

In our neighboring state of Wisconsin, Lorenz² recently stated that the incidence of syphilis in the general sick does not exceed 3 per cent and that the admission rate of late syphilis to State Hospitals has been reduced over 60 per cent in the last ten years.

Syphilis for many years has been decreasing. It is becoming increasingly difficult to obtain sufficient active cases for teaching purposes in many of our Universities. Syphilis also has decreased tremendously in private practice and especially so among men who specialized in the disease.

Table III, below, will show the decrease at the Minneapolis General Hospital where we treat more cases than are treated in any clinic in the state.

TABLE III.

	Primary	Secondary	Tertiary	Pre-natal	Total
*1937	10	19	174	13	216
1936	15	32	217	11	275
1935	27	66	297	7	397
1934	31	78	268	26	303
1933	29	113	269	33	444

*Over a ten months period.

With these figures from our own state and from Wisconsin it seems that we are making a successful attack upon syphilis and have been doing so for many years. This success by no means should cause us to lessen our efforts but should spur us on to a greater and more effective attack upon the disease.

Suggestions for Further Efforts

1. The more widespread use of the Wassermann reaction as a routine in general medicine.
2. Early and routine Wassermanns upon all pregnant women. An early discovery of syphilis in a pregnancy can practically eliminate prenatal syphilis.
3. Greater facilities for dark field examinations.
4. Better social service work in looking up sources and contacts.
5. Special attention and close follow-up as to continuous treatment should be given to food handlers, pregnant women, prenatal syphilitics and prostitutes.
6. Continued education of the medical profession in regard to long and continuous treatment of syphilis.

References

1. Diehl, H. S.: Wassermann, reactions in college students. *Am. Jour. Pub. Health*, 21:1131, (Oct.) 1931.
2. Lorenz, W. F.: Syphilis in Wisconsin. *Wis. Med. Jour.*, 36:188, (March) 1937.
3. Van Etten, N. B.: Medical service for all Americans. *Minn. Med.*, 20:411, (July) 1937.

MARCH, 1938

PRIMARY SYPHILIS

JOHN BUTLER, M.D.
Minneapolis

After inoculation of the broken skin or mucous membrane with the spirochete pallida, a syphilitic incubation period begins which lasts approximately seven weeks. During this incubation period there is a gradually increasing general spirochetal invasion of the tissues through the blood stream. One to two weeks later (eighth or ninth week of the disease) the reaction in the tissue caused by localized foci of spirochetes produces the eruptive manifestations of the disease.

During the first three weeks of the incubation period there is no evidence to the patient or the physician of the impending disease. Between the third and fourth weeks the primary lesion or chancre appears.

A week or ten days after the appearance of the chancre, the regional lymph glands enlarge and show the characteristic pea- to nut-sized round, hard, freely movable, painless, nodular swellings. During the ensuing three weeks the lymph glands in distant parts of the body become involved.

The systemic symptoms in primary syphilis are usually slight or absent and are of no diagnostic import. More frequently they are present and intensified in the secondary or eruptive stage of the disease. When present, they may show as anemia, fever, headache, insomnia, arthritic pains, etc.

Our conception of the course of early syphilis has been changed as a result of the discovery that the lymph and blood of animals and humans infected with syphilis may contain the spirochetes a few hours after infection and may be found in the blood stream for an indefinite time—months or years—in latent Wassermann-negative cases. This brings to the fore the potential danger of transfusion syphilis from latent syphilitic donors.

A clinical diagnosis of the incipient primary lesion is generally impossible and uncertain and the fully-developed chancre, to the unpracticed eye, is often undiagnosed.

The chancre, like other manifestations of syphilis, varies in appearance according to the location, the structure and reaction of the tissue in which it is situated. It may assume different appearances as to shape and size, surface secretions, and multiplicity. It may, or may not, be indurated. We read in many current textbooks on syphilis that the primary lesion presents a fairly definite appearance, the induration of the sore receiving special consideration in formulating a positive diagnosis. As a matter of fact, there are clinical varieties of the chancre that show no appreciable induration on the most careful examination.

Prior to the discovery of the spirocheta in the initial lesion of primary syphilis, the clinician's attitude was that of watchful waiting and observation.

An early diagnosis of primary syphilis depends on finding the spirocheta pallida in the early chancre before the organisms have been disseminated and local-

ized in large numbers in the denser tissues throughout the body, before profound pathological changes have taken place. The Wassermann test is of no diagnostic value during the first five weeks of the disease, as it is usually negative then.

If the chancre has been treated locally with antiseptics, especially mercurials, it is a waste of time to attempt to recover the spirocheta pallida from the lesion. By stopping the local treatment, they may or may not be demonstrated after a week or ten days. In such cases, aspiration of the adjacent lymph nodes may be successful. The dark field method should be used instead of the India ink or staining method.

The possibility of aborting or curing a large percentage of primary syphilis by early diagnosis (before the sixth week of the disease) when the Wassermann is usually negative, should not be overlooked; and immediate intensive treatment should be a matter of persuasive interest to the physician of today. Every day lost in diagnosis and treatment is of vital importance to the patient. The patient receiving early treatment, when the primary lesion is not more than a week or ten days old and with a negative Wassermann, has a 25 per cent better chance for a cure than a patient with secondary syphilis.

VISCERAL SYPHILIS

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I am detailed to speak on visceral syphilis. With the limited time at my disposal, I would like to confine myself to one type of visceral syphilis—namely aortitis and its sequences. Syphilis of the stomach is rather rare and more or less problematic. Syphilis of the liver is likewise not so common and perhaps not so problematic. There is no organ in the body exempt from syphilitic invasion except the ovary. Wartin claims he has never seen the ovary involved.

It is thirty-two years since the Treponema palida was discovered. It is thirty years since salvarsan was first used. The curative effect of standard syphilitic therapy is as high if not higher than any other treatment for any other disease, surgical or medical. Why is it there is so much visceral syphilis in our population today? Let me just hint at several factors which may be involved in the explanation of this paradox. There is the psychology of our people who still cling to the attitude that syphilis is a disgrace rather than misfortune. This is a cause for a lag in getting early treatment. The high cost of therapy and the time element hinder the result. That leads me to the statement that the treatment of 60 per cent of all venereal disease is in the hands of 5 per cent of the physicians. In other words, the treatment has become highly specialized. Students of this phase of the problem are beginning to think that this is a mistake. The treatment of syphilis should be in the hands of the family physician and general practitioner. I am aware the last

statement has its controversial point. I have stated it merely to show the trend of things in the larger problem.

Potentially speaking, every syphilitic may develop aortitis. It usually manifests itself in the most efficient years. It is the commonest lesion found at the post mortem table. It is the most deadly visceral lesion. It is one of the most avoidable complications if proper treatment is instituted and carried out in the primary stage. In its uncomplicated state, it is extremely difficult to diagnose. It is this last feature I wish to elaborate and emphasize.

In 1885 Dohle definitely established the difference between syphilis and atherosclerosis of the aorta. It took some eighteen years before it was definitely accepted by his German colleagues. It is only in recent years that some semblance of order is establishing itself regarding aortitis as a clinical problem. Langer in Germany reports 23,105 necropsies on syphilitics of which 70 to 80 per cent showed evidence of involvement of the aorta.

The clinical grouping is seen in Table I. The standard of diagnosis usually given is that by Carter and Baker (Table II). A year later Moore, Dangle and Reisinger modified this as shown in Table III.

TABLE I. CLINICAL CLASSIFICATION

1. Uncomplicated Aortitis. Latent 4.9 to 49.5 per cent in all types of aortitis (living).
2. Aneurysm. Latent syphilis 1.2 per cent, active 11.8 per cent, postmortem 27.7 per cent.
3. Aortic Valvulitis. Living 2.7 per cent to 4.1 per cent, postmortem 24.7 per cent to 36.5 per cent.
4. Coronary osteal involvement. Postmortem 19.9 per cent to 33.3 per cent.
5. Combinations of 1 with either 2 or 3 or 4.
6. Aortitis or its complications associated with lesions of the heart unrelated to syphilis, i.e., hypertension (essential or renal), coronary disease (atherosclerosis), valvulitis due to rheumatism; subacute bacterial endocarditis (rare); pericarditis (rare).

The standard for the diagnosis of aortitis in general is usually that given by Carter and Baker.¹

TABLE II. STANDARD FOR DIAGNOSIS OF AORTITIS
(Carter and Baker)

1. The history of a relative abrupt and unexpected onset of circulatory embarrassment.
 2. The presence of a positive Wassermann reaction.
 3. A demonstrable increase in the retromanubrial dullness in the second interspace and a change in the tonal qualities of the second aortic sound. The fluoroscopic evidence of aortic dilatation.
 4. An absence of the signs of mitral disease connating rheumatic infection.
 5. The history of paroxysmal dyspnea, often nocturnal.
 6. The history of pain, particularly paroxysmal pain.
 7. Progress in cardiac failure.
- If any five of these seven criteria are present, a diagnosis of cardiovascular syphilis can be made.

Moore, Dangle and Reisinger² give as criteria for an uncomplicated aortitis diagnosis any three of the following seven criteria.

TABLE III. STANDARD FOR DIAGNOSIS OF AORTITIS
(Moore, Dangle and Reisinger)

1. Teleroentgenographic and fluoroscopic evidence of aortic dilatation.
2. Increased manubrial dullness.
3. A history of circulatory embarrassment.
4. A tympanic, bell like, tambour, accentuation of the second aortic sound.
5. Progressive cardiac failure.
6. Substernal pain.
7. Paroxysmal dyspnea.

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TABLE IV. A COMPARISON OF THE CORRECTNESS OF THE CLINICAL AND PATHOLOGICAL DIAGNOSIS OF SYPHILITIC AORTITIS IN ONE HUNDRED AND FIVE CASES SO DIAGNOSED AT NECROPSY²

	Total Cases	Syphilitic Aortitis		Diagnosis could have been suspected on basis of physical findings			Diagnosis obscured by other cardiovascular lesions	Heart and aorta thought clinically normal	Patient too ill for adequate examination
		Definitely diagnosed	Suspected	Signs	Symptoms	Both			
Medical Service	63	4	12	12	2	9	9	11	4
Surgical Service	42	0	1	5	4	3	3	23	3
	105	4	13	17	6	12	12	34	7
Percentage of Total		16.2			33.3		11.4	32.3	

TABLE V. THE CORRECTNESS OF THE CLINICAL DIAGNOSIS OF SYPHILITIC AORTITIS AS INFLUENCED BY THE CAUSE OF THE FATAL ILLNESS²

	Total Cases	Diagnosis correctly made or suspected	Diagnosis might have been made	Diagnosis obscured by other cardiac findings	Diagnosis missed (Impossible to make. ?)
Fatal illness related to syphilis	24	6 (25%)	7 (29%)	5 (20%)	6 (24%)
Fatal illnesses unrelated to syphilis which if diagnosed was an incidental finding	81	10 (12%)	29 (35%)	7 (8%)	35 (43%)

Moore et al² made a study of 105 cases of aortitis uncomplicated by aortic regurgitation or aneurysm. They worked backward from the postmortem material to the clinical findings (Table IV). From a study of this chart only four of the 105 were definitely diagnosed and thirteen were suspected, making a total of 16.2 per cent. There were twenty-three cases where the diagnosis could have been suspected on the bases of physical signs, and incidence of 33 per cent. There were 12 cases where the diagnosis was obscured by other cardiovascular lesions—11.4 per cent. There were thirty-four in which the heart was considered normal clinically—32 per cent, and there were seven cases in which the patient was too ill for adequate examination.

In the cases which were correctly diagnosed or suspected, either the classical signs of widened manubrial dullness, pulsation in the suprasternal notch, an aortic systolic murmur or an altered tympanic, bell-like quality of the second sound, or the symptoms of substernal pain, dyspnea on exertion or paroxysmal nocturnal dyspnea, or both signs and symptoms were present. In the thirty-five cases which could have been diagnosed, these symptoms and signs were present in some degree.

The significance of these findings were entirely disregarded by the clinicians. The majority of these patients were admitted for an acute illness unrelated to syphilis. Judging, however, from the extent of the

lesions at autopsy, they suggest that the clinical diagnosis was not necessarily impossible.

Table V gives the correctness of the clinical diagnosis of syphilitic aortitis as influenced by the cause of the fatal illness.

Curiously enough hypertension which can confuse the picture did not make the diagnosis more difficult. In fact, more cases of aortitis with hypertension were correctly diagnosed than without hypertension.

The most recent study of uncomplicated aortitis is that by Wilson.³ He too worked backward from the postmortem table to the clinical findings. His material consisted of 106 cases. Extensive pathological changes were found in twelve, moderate in twenty-seven and only slight in twenty-one cases. Three cases showed marked dilation; there was moderate dilation in seven, slight in ten and there was a normal sized aorta in forty cases. He agrees the physical signs adopted in the above criteria are without a doubt dependent on aortic dilation. The symptoms, however, "are by no means indisputable and the validity of ascribing certain of these symptoms to purely uncomplicated aortitis has been seriously questioned."

He quotes Keefer and Resnik who in twenty-four cases of uncomplicated aortitis never found dyspnea on exertion, nor paroxysmal dyspnea, nor signs of myocardial insufficiency. In every case where such symptoms supervened, there was some additional factor, aortic insufficiency, aneurysm, myocarditis, hyper-

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TABLE VI. INCIDENCE OF SYMPTOMS IN SYPHILITIC AORTITIS³

	Total* Cases	Dyspnea on exertion	Paroxysmal dyspnea	Precordial pain	Congestive heart failure
With aortic insufficiency	49	49	14	10	49
With thoracic aneurysm	31	24	5	7	13
With narrowing of coronary ostia	21	20	5	8	15
Uncomplicated syphilitic aortitis	106	44	4	5	34
Inadequate history	17				

*Thirteen patients had more than one of the complications of syphilitic aortitis, i.e., aortic insufficiency, aneurysm, or coronary involvement.

TABLE VII. ANALYSIS OF SYMPTOMS IN CONDITIONS ASSOCIATED WITH UNCOMPLICATED SYPHILITIC AORTITIS³

	Total Cases	Dyspnea on exertion	Paroxysmal dyspnea	Precordial pain	Congestive heart failure
Hypertensive heart disease	29	29	2	4	28
Chronic nephritis	7	5	1	0	3
Coronary heart disease	5	5	1	1	1
Chronic myocardial degeneration	2	1	0	0	0
Tuberculous pericarditis	1	1	0	0	1
Obstructive lesions	2	2	0	0	1
Without other cardiovascular disease*	60	1	0	0	0
Totals	106	44	4	5	34

*The one patient showing dyspnea had leukemia.

tension or organic obstructive lesions. He cites Maynard, Curran and Rosen who conclude myocardial failure only ensues after some complication develops. Adequate explanation of the story of circulatory embarrassment, progressive heart failure, substernal pain, and paroxysmal dyspnea, long considered as typical of pure aortitis, has not been given. In other words, when symptoms of circulatory embarrassment occurs, the case has gone beyond the stage of simple aortic involvement, or there are complications unrelated to syphilitic aortitis which explain the symptoms. He cites sixty cases of the 106 in which an analysis of the symptoms were possible. In only one was there a record of dyspnea, and that patient had leukemia (Tables VI and VII).

Wilson's analyses which reveals that uncomplicated aortitis is an asymptomatic disease is quite correct, which leaves for our diagnosis of this condition only the physical signs. These signs must depend entirely on weakness dilatation of the aorta. If this is present, increased manubrial dullness in the second interspace, a systolic bruit at the base, or a second sound having bell-like qualities should put us on our guard. These with a history of syphilis, or a scar on the penis, or a positive Wassermann reaction makes the diagnosis fairly reliable. With the growth of x-ray technic, our finger-tips, our eyes and ears are losing their sense of accuracy. Few men will accept a diagnosis of a chest condition on the data which inspection, palpation, percussion and auscultation afford. Without the x-ray check, as it is called, our physical signs are not complete. The x-ray criterion for aortitis uncomplicated by aneurysm is usually considered either an increased

density of the aorta or an increase in the width of the aortic arch. In a six-foot plate of the arch in the anterior-posterior direction two measurements are computed in estimating the diameter of the arch. The first is the distance from the widest part of the ascending aorta to the midsternal line. The second is the distance from the farthest lateral point on the knob to the midsternal line. The sum of these two is an arbitrary diameter of the aortic arch. There is another computation. The width of the aorta is measured in the right oblique. The inability to visualize this frequently makes its value less than the arbitrary diameter of the arch. Between the ages of seventeen and fifty-nine in the male, this figure gradually increases from 4.6 to 6.1 cm.; in the female from 4.3 to 5.6 cm. Any variation above these figures of 0.5 cm. can be considered abnormal within 80 per cent of accuracy. Four conditions, as a rule, may produce a change in the silhouette of the arch either by dilation or by displacement of the aorta. They are syphilitic aortitis, aortic insufficiency, hypertension and arteriosclerosis. With such an array of causes the x-ray is quite limited in its usefulness. It can tell us there is a change in the aorta. To sift out these components, we must resort to the history, physical findings and laboratory data. In uncomplicated aortitis this is an extremely difficult task. Since it is the stage in which prevention of aneurysm or valvulitis or both is possible, it is most important that it be recognized. Statistics show that very few cases treated at this period go into the symptomatic phases of aortitis. Furthermore, statistics show that uncomplicated aortitis rarely is found in persons given the proper antisiphilitic treatment in the

chancre stage. Better still would be the eradication of the scourge of syphilis itself.

This is a public health problem. What has been done in the Scandinavian countries can be done in our own.

References

1. Carter and Baker: Certain aspects of cardiac disease, Johns Hopkins Bulletin, 48:315, 1931.
2. Moore, J. E., Dangle, J. H., Reisinger, J. E.: Arch. Int. Med., 49:753, 1932.
3. Wilson, Robert, Jr.: Am. Jour. Med. Sci., 194:180.

ASYMPTOMATIC NEUROSYPHILIS*

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Asymptomatic neurosyphilis is the most significant manifestation of syphilis of the central nervous system. This somewhat inclusive statement is based on the following facts: (1) asymptomatic neurosyphilis becomes clinical neurosyphilis if not sufficiently treated; (2) in the great majority of cases of asymptomatic neurosyphilis, the response to treatment is exceedingly good if treatment is adequately and intensively given; (3) by the early recognition and thorough treatment of asymptomatic neurosyphilis the development of the late forms of neurosyphilis, such as tabes dorsalis, paresis, and so forth, may be avoided, a fact which emphasizes the preventive value of adequate treatment of this complication of the disease. Accordingly, it is my purpose in this paper to discuss the incidence, the prognosis and the results of various types of treatment of asymptomatic neurosyphilis.

As the name implies, asymptomatic neurosyphilis is recognized by the finding of a positive spinal fluid test in a case in which neither clinical signs nor symptoms of neurosyphilis are present. The complication is a manifestation of syphilis in any of its various phases; and for reasons to be discussed shortly, it is divided into two groups, early and late. Early asymptomatic neurosyphilis is seen among those patients whose syphilis is of four years' duration or less, while among patients who have late asymptomatic neurosyphilis are those whose disease has been present for four years or more. As has been said, asymptomatic neurosyphilis is recognized by the obtaining of positive tests of the spinal fluid. In testing the fluid it is essential to do not only the Wassermann or flocculation procedure, but also to count the lymphocytes and other cells which may be present, to do a colloidal benzoin or colloidal gold test, and to estimate the globulin and protein content. The analysis of these five factors of the fluid permits classification of the type of invasion or involvement existing in the nervous system at the time the examination is made. Such classification is essential to an intelligent program of treatment. For example, if a patient has acute syphilis, the finding of 30 lymphocytes (normal 1 to 6) per cubic millimeter of spinal fluid with negative flocculation, globulin and colloidal tests indicates that invasion of the central nervous system has taken place. In such a

case, if the Wassermann or flocculation test on the blood does not revert to negative and remain so after treatment is completed, or if it continues to remain positive during treatment, presumptive evidence is at hand that the treatment has not controlled the complication and that what was merely an invasion has now become, or is in the process of becoming, an involvement of the central nervous system. Another significant reason why all the tests of the spinal fluid are essential is that patients are encountered who have acute syphilis, and examination of their spinal fluids discloses the following: strongly positive Wassermann tests, positive globulin tests, 60 to 80 mg. or more of protein per 100 c.c., a cell count of 50 or more lymphocytes per cubic millimeter, and a Zone I or paretic type of colloidal test.* A spinal fluid which gives these findings is interpreted as a paretic type of fluid, and its presence indicates that the treatment must be carried not only beyond that given to the average patient, but also that the spinal fluid must be examined frequently during the course of treatment and several times after the fluid has become negative. This last is urged as a precaution against neurorelapse because this type of fluid is especially prone to relapse to positive.

In the late type of asymptomatic neurosyphilis, appraisal of all the factors referable to the spinal fluid is also essential for adequate management of the case, not only because examinations of the spinal fluid permit a classification which prognosticates the eventual outcome of the case, but particularly because it enables the physician, by repeated testing of the fluid, to estimate intelligently the effect of treatment on the course of the disease. As will be shown subsequently, a patient who has late asymptomatic neurosyphilis, with a spinal fluid of paretic formula, which does not lose its paretic characteristics under two or more intensive courses of treatment with arsphenamine and bismuth or mercury, should be considered a candidate for more radical therapeutic measures, such as intraspinal or fever therapy. If all of the named diagnostic tests are not done on the first examination of the spinal fluid, subsequent efforts to estimate changes in the fluid, either favorable or otherwise, will be impossible. Attention is also called to the fact that in tests of spinal fluid the cell count is the first indicator of a return to normal, and that the colloidal test is the second in order of frequency to revert to the normal side; the globulin and protein tests follow, and the Wassermann test, as a rule, is the last to become negative. Accordingly, it is recommended, in fact it is urged, that all these tests be considered each time the spinal fluid is examined, and that repeated examinations of the spinal fluid of patients with asymptomatic neurosyphilis be made during the treatment if

*In a normal spinal fluid the colloidal gold or benzoin test is reported as follows: 0 0 0 0 0 0 0 0 0 for the gold, or 000 000 110 000 000 for the benzoin. With a paretic patient the curve for gold will be reported as 5 5 5 5 5 4 2 1 0 0, whereas that for benzoin will be reported as 333 333 333 321 000. The syphilitic or tabetic curve, which is considered a favorable type of report for the neurosyphilitic patient, is recorded 0 1 2 3 3 2 1 0 0 for the gold, and 000 000 333 000 000 for the benzoin.

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the result is to be appraised adequately. Examination of the spinal fluid should also be made at least twice yearly after the fluid has become negative. Apropos of this last statement it is acknowledged that the flocculation tests, such as the Kahn, Kline, and Hinton, are so much more valuable than the older Wassermann technics that repeated examinations of a spinal fluid which has become negative are not essential if flocculation tests of the blood are repeatedly negative.

I have already commented on the fact that asymptomatic neurosyphilis is a manifestation of acute syphilis. In the coöperative clinical studies,¹ evidence has been accumulated which shows that among 30 per cent of patients who have primary syphilis the central nervous system has already become invaded. A study of the later manifestations of the disease revealed that in secondary syphilis 35 per cent, and in 56 per cent of the patients with recurrent secondary syphilis manifestations of neurosyphilis in one or the other of its many forms were noted. This incidence in a group of patients who were not treated is highly significant, as it demonstrates that a half to a third of those who acquire syphilis are potentially neurosyphilitics. Moore² carried this type of study further in that he appraised the incidence of asymptomatic neurosyphilis according to the yearly duration of the disease and found that the lowest incidence occurred in cases in which the disease was of four years' duration. From the fourth year on, the incidence of the disease remains the same, about 10 per cent, while the incidence of the clinical forms of neurosyphilis steadily increases after the fourth year. This effort to control the disease by development of the defensive mechanism during the first four years of infection is to be noted in other manifestations of syphilis, and it is the reason for classifying asymptomatic neurosyphilis as the early type, which includes cases in which patients are in the first four years of the disease, and the late type, or those who have had the infection more than four years.

A discussion such as this would be incomplete without calling attention to the influence of treatment of acute syphilis on the incidence of asymptomatic neurosyphilis, as it particularly emphasizes the value of certain methods of treating the disease in its early manifestations. Among patients who received more than twenty-four injections of mercury or bismuth given by the so-called continuous system, I found asymptomatic neurosyphilis in 7.5 per cent. Among those whose treatment was inadequate, consisting of less than twenty-four injections of arsphenamine and a metal, 22 per cent had a positive spinal fluid test. If the treatment was given at irregular intervals, and with no thought to system or persistence, the incidence increased practically to 30 per cent. These data are significant in that they illustrate the fact that a sufficient amount of treatment during the acute phase of syphilis, if given intensively and by the continuous system, will cut the incidence of asymptomatic involvement of the central nervous system in late syphilis in half.

The prognosis of asymptomatic neurosyphilis is, on the whole, quite satisfactory if treatment is adequate and sufficiently intensive. My observations indicate that if both the specific and the nonspecific therapeutic measures are employed, satisfactory serologic reversal may be obtained in more than 65 per cent of these cases, and that in less than 3 per cent of the cases in which asymptomatic neurosyphilis was treated adequately by all the therapeutic measures at our command today, did clinical manifestations of neurosyphilis develop. These figures illustrate the value of adequate treatment in the prevention of serious sequelae in the nervous system, and in the discussion on treatment attention will be called to the different methods or systems of treatment which have been proved of value.

The earlier in the course of the disease, invasion of the central nervous system is noted, the more satisfactory are the results of treatment. In the early type of syphilis, of less than four years' duration, most of the cases in which examination of the spinal fluid reveals a mild form of the disease will give evidence of a complete serologic reversal following three courses of arsphenamine and mercury. I have shown that it is the normal tendency for the fluid to revert to negative by the fourth year of the disease, so that treatment should be directed to the encouragement of this phenomenon. In those cases in which the findings on examination of the spinal fluid are of the parietic type, the incidence of favorable response is lower in both the early and late types of asymptomatic neurosyphilis, and it is in these cases that the application of the more intensive systems of treatment is warranted. In a case in which the findings on examinations of the spinal fluid are of the parietic type, and the patient has failed to give evidence of improvement following the first course of arsphenamine and bismuth or mercury, the use of intraspinal therapy of the Swift-Ellis type will double the number of cases of successful serologic reversals.

My experience with the Swift-Ellis technic has impressed me repeatedly with its outstanding value for this type of neurosyphilis, and it is to be regretted that so valuable a measure is not used more liberally in the treatment of asymptomatic neurosyphilis. One of the reasons that the method is not used more universally is perhaps attributable to its inefficiency in the treatment of *tabes dorsalis* and general paresis, as the accumulated evidence indicates that its value in these manifestations of syphilis is best in the early cases. In the advanced forms of *tabes dorsalis* or general paresis, the results of treatment of this type are unfavorable.

Patients who have received three or four regular courses of arsphenamine and bismuth or mercury, augmented by several combined intraspinal courses, and whose spinal fluid has not been materially influenced, are those among whom parenchymatous neurosyphilis is prone to develop. Before continuing further with a discussion of methods of treating such patients, I will digress for a brief but fundamental discussion of neurosyphilis. There are three possible explanations

of the development of neurosyphilis: (1) *Spirocheta pallida* may be of the neurotropic strain; (2) treatment received during the acute phase of the disease may have been insufficient, irregularly given, or even inefficient in its effect, and (3) the "soil" may be predisposed to the development of neurosyphilis, a conception which includes the elusive factors of resistance or immunity. An analysis of these three explanations indicates that although a neurotropic strain of the organism is demonstrable in the laboratory animal, evidence is still lacking that a specific strain with particular affinity for the nervous system attacks man. That inadequate treatment predisposes to neurosyphilis has been demonstrated in this statistical study. An explanation has not been advanced, however, as to why neurosyphilis eventually develops in certain cases even though the patients were treated thoroughly during the early stages of syphilis. It is possible that the treatment, although adequate as to amount and intensity, was inefficient. The third conception involves the factor of lack of resistance, and it seems the most plausible explanation for the failures in treatment. This is evidenced by the frequency with which neurosyphilis develops in the early case in which treatment was adequate. An experience with nonspecific therapy, especially malaria therapy, during the past ten years has repeatedly emphasized the superiority of fever therapy in the treatment of neurosyphilis when the so-called specific remedies have failed. Accordingly, when the patient with asymptomatic neurosyphilis has received arsphenamine and mercury or bismuth in adequate amounts and in an intensive manner, and when intraspinal therapy has been added and tests of the spinal fluid continue to remain positive and to indicate the malignant nature of the condition, it is advisable to adopt a different therapeutic program. When a fair trial with the specific agents fails to produce the desired serologic result in a given case, it is logical to adopt measures that are directed toward stimulation of the patient's resistance and to drop those which have been inadequate in the destruction of the invading organisms. This is the rationale for the use of malaria therapy in neurosyphilis who have failed to secure serologic reversal.

In several other reports I have called attention to the value of malaria therapy in the prevention of general paresis. When the use of specific remedies fails to influence satisfactorily the course of the disease, application of intensive nonspecific measures will completely reverse the course of the disease in many of the cases. The mechanics by which this is accomplished is still not understood and the method continues to be used empirically. Treatment with typhoid vaccine produces a lower incidence of serologic reversals than malaria therapy, and my experience with electric units that produce fever is still too limited to permit me to pass judgment on their value. Tryparsamide has been proved to be inefficient in the control of asymptomatic neurosyphilis, as the highest incidences of progression to clinical neurosyphilis were noted following its use and the use of silver arsphenamine.

Summary and Conclusions

Asymptomatic neurosyphilis is to be anticipated in approximately a fifth of all cases of syphilis, and it must be eliminated by examination of the spinal fluid in all cases of acute syphilis in which the Wassermann or flocculation tests on the blood remain positive; likewise, if serologic tests on the blood revert to positive when treatment is stopped, invasion of the nervous system should be suspected. Eighteen per cent of patients with latent syphilis who are "Wassermann fast" will be found to have asymptomatic neurosyphilis. The results of treatment in cases of early asymptomatic neurosyphilis are decidedly better than those cases in which the disease is of four years' duration or more. Accordingly, the spinal fluid should be examined early in order that the complication may be handled intelligently. The fact that the patient develops the maximal amount of resistance against invasion of the central nervous system during the first four years should also be kept in mind in treating syphilis of longer duration. Routine measures are successful in the majority of cases, but when they fail the addition of intraspinal therapy may satisfactorily reverse the serologic reaction. The fact that five or more courses of arsphenamine and bismuth or mercury, and intraspinal therapy in addition, fail to produce serologic reversal is indicative not only of a malignant type of involvement of the central nervous system, but also suggests that an adequate defensive mechanism is lacking against such involvement. The use of malaria therapy in such cases apparently supplies the necessary stimulus to the mechanism by which immunity is obtained. Fever therapy is therefore of value in the treatment of parenchymatous neurosyphilis, and in the treatment of asymptomatic neurosyphilis in cases in which satisfactory serologic reversals have not been produced following the use of arsphenamine, bismuth and mercury.

References

1. Clark, Taliaferro, Parran, Thomas, Cole, Harold, Moore, J. E., O'Leary, P. A., Stokes, J. H., and Wile, U. J.: Cooperative clinical studies in the treatment of syphilis. From Venereal Disease Information, Reprint No. 41, vol. 13, Nos. 4, 5, 6, 7, (April, May, June, and July) 1932.
2. Moore, J. E.: The modern treatment of syphilis. Baltimore: Thomas, p. 535, 1933.
3. O'Leary, P. A.: Treatment by malaria in asymptomatic neurosyphilis. Jour. Am. Med. Assn., 97:1585-1586, (Nov. 28) 1931.
4. O'Leary, P. A.: Malaria therapy in asymptomatic neurosyphilis. Ann. Int. Med., 7:1513-1522, (June) 1934.

SYPHILIS AS SEEN IN THE NEUMANN CLINIC THIRTY-FIVE YEARS AGO

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What I have to say tonight is a memory sketch of thirty-five years ago. Incidentally I might say that of the 1,500 men who are practicing medicine in Minneapolis and Saint Paul I do not believe that there are fifty who know syphilis clinically when they see it; their diagnosis depends entirely on whether or not a patient has a positive Wassermann.

I arrived in Vienna in January of 1900. At that time there were two rival clinics, Kaposi Clinic known

as Dermatology and Syphilis, and the Neumann Clinic known as Syphilis and Dermatology. The rivalry between these two goes back quite a little farther. In the early days Hebra, who is known as the father of Dermatology, had two assistants, Cohn and Neumann, both Jewish. He also had a charming daughter. Cohn and Neumann both wanted to marry the girl but Hebra, who was a German, said that he would not have a Jew in his family. A few weeks later Hebra had a heart-to-heart talk with Cohn, who went down to Hungary to the village where he was born and paid one gulden to have his name changed to that of the village, then came back to Vienna and, as assistant, Kaposi married the girl. If any of you are so fortunate as to have a copy of the first edition of Kaposi's *Haut Krankheiten* you will find at the foot of the first page of the tenth or twelfth chapter a footnote which states "at this point J. Cohn changed his name to Kaposi."

The teaching in those days was purely clinical. The spirochæta and the Wassermann reaction had never been heard of. Teachers at that time believed that each different variety of syphilis was due to a different virus. Professor Neumann taught in 1900 that syphilis was due to a specific cause. He felt that there were three types of this virus: one which attacked the skin, one the bones, and the third the nervous system.

In those days syphilis was not considered as a constitutional disease, it was simply dermatology. We were taught that eruptions developed on the flexor surfaces of the body; that all lesions on the skin were round and painless; all ulcerative lesions were necrotic, not granulating; that the chancre instead of being covered by a granulating surface is covered by necrotic tissue. It is only when the chancre has begun to heal that it presents a granulating surface.

We were taught that syphilis had two incubation periods, one from the time of the infection to the appearance of the initial lesion, twenty-one days; the second period was from that time until the general eruption appears on the body. They traced the age of the infection by the clinical skin condition. If there was a sore on the penis, round with a sloping edge and a necrotic base, it was an initial lesion, infection twenty-one days old. If the base of the sore has become indurated, infection is twenty-eight days. By the thirty-fifth day lymphatic glands on one groin have become enlarged and by the forty-second day, glands of the opposite groin. If the glands in the posterior triangle of the neck and the epitrochlear glands were palpable the condition was forty-nine days old. The eruption came out on the body on the fifty-sixth day. We were taught that the normal course of syphilis, if left untreated, was a relapse every three months. For example, if a man was infected the first of April he would develop an eruption on his body approximately the first of June. This eruption would remain bright for a few weeks and then gradually fade, to disappear partially or completely until about the first of September, when a new eruption would appear. We were taught that the lesions of the new eruption

would be the same as those of the primary; that is, a macular eruption would follow a macular eruption and the papular follow a papular. The relapsing eruptions were different from the primary by the fact that they were larger and showed a more or less well-defined tendency to grouping. It was taught that certain eruptions were characteristic of certain ages of the disease, as, for instance, the loss of the hair on the side of the head never occurred before the first relapse, which would be at the fifth month, and was not a part of late syphilis; that the condylomata, or moist papules which develop at points of irritation, as between the buttocks, about the genitals, or under the pendulous breasts of women, never occurred before the ninth month. Every man was taught to know symptoms so that he could tell the age of a given case up to a year.

The teaching was entirely clinical. Professor Neumann lectured from nine to ten o'clock, Professor Kaposi from eleven to twelve o'clock. During the hour from ten to eleven their clinics for ambulatory patients were held. The daily visit in the Neumann wards was made at eight in the morning. I think that I am the only American who was ever invited by Professor Neumann to make the visits with him. I made this morning visit with him for fourteen months. At this visit all patients in the hospital were reviewed. The men came before the Professor wearing a mantle, or linen duster, and a pair of slippers. This mantle was removed, the slippers kicked off. Every patient was examined stark naked although the only lesion on his body might be a spot on his face. If the patient was syphilitic he was required to show the palms and the soles.

In the female wards the girls wore a loose blouse, short skirt and slippers. When they came up before the Professor the blouse was removed, they then dropped their slippers and were then put up on the table. The skirt was pulled up and the lower half of the body and genitals examined.

The treatment of syphilis at that time was entirely by mercury. The Kaposi Clinic used hypodermic solutions of salicylate, bichloride or succinamide of mercury. The Neumann Clinic used the inunctions of mercurial ointment exclusively. Both clinics agreed that it was a mistake to begin treatment in a case of syphilis before the constitutional symptoms had appeared; that no matter how early it was begun it would not prevent, simply delay, the appearance of the eruption. They were also sure that the cases treated early, that is, before the eruption appeared, did not run a normal course. In the Kaposi Clinic the hypodermics were given intramuscularly in the gluteal region, the soluble salts given every day and the insoluble salicylate given once a week. In the Neumann Clinic the inunctions were carried out by the patients themselves. Six men were placed astride a narrow bench, each rubbed the mercurial ointment into the back of the man in front of him. Every day the man in the front of the row took his place at the foot so that in a week each man had six days' treatment and one day's rest. As

a routine, the course of treatment inunction was kept up until all symptoms disappeared and then continued half again as long. The average course was about six weeks, and under no circumstances continued longer than eight weeks whether symptoms had disappeared or not. It had been clinically observed that at the end of eight weeks patients became satiated with mercury and the treatment was no longer effective. Following this routine course of treatment a patient got four courses of mercury the first year, the second year he was given three courses, in the third year one or two depending on the number of clinical relapses he had developed. After that no further treatment was given. If at the end of the fourth year the patient had been without clinical symptoms for a year he was considered cured and was allowed to marry.

Syphilis was known to them as a disease of the skin. They believed and taught that nerve syphilis, which they called parasyphilis, was not due to the syphilis virus but to the toxin which had been produced and had remained in the body.

At my last visit to Vienna in 1906 the spirochæta had been discovered and I saw in the laboratory of Professor Ehrmann the first spirochæta that was ever stained in nerve tissue. Some years later Noguchi stained the spirochæta in the spinal cord, proving that locomotor ataxia is due to a direct invasion of the cord by the parasite.

Discussion

DR. C. D. FREEMAN, St. Paul: Syphilis has been discussed this evening from A to Z. As you have probably noticed, there have been no recent advances in its treatment. The real messages as regards syphilis are all history and some of them have been very important. Whether any new discoveries are to be made remains to be seen.

Off-hand, I would say there have been about six messages pertaining to syphilis that stand out prominently:

1. Discovery of causative factor.
2. Ehrlich's salvarsan therapy.
3. The Wassermann blood test.
4. Noguchi's finding of the spirocheta pallida in the brain and cord tissue.
5. Malarial inoculation for paresis.
6. Bismuth and tryparsamide therapy.

Twenty-five years ago, or before Schaudin and Hoffman discovered the spirocheta pallida as the causative factor of syphilis, we were taught not to treat the primary lesion of syphilis until the secondaries appeared, with the result that the patient carried an infectious lesion for six weeks, and then, when the secondaries appeared with mucous patches, etc., he became doubly infectious; and this was followed by several weeks more of transmission until the patient was under control with mercurial rubs or salicylate of mercury injections. It is easy to understand how difficult it was to control a disease under these circumstances.

At present, when a patient with a primary lesion presents himself, a dark-field examination is made and he is given a salvarsan at once. Twenty-four to forty-eight hours after his first salvarsan injection it is difficult to find any organisms in the lesion; and, personally, I believe after the second or third salvarsan he is not infectious and will remain so providing he continues his treatment.

As to the Wassermann reaction, it has been a great

aid when there is any doubt as to diagnosis. In every general examination by any medical man, a Wassermann test should always be included. In this way, cases of syphilis are picked up which would otherwise be overlooked. A four plus Wassermann reaction does not by any means prove conclusively that a patient is infectious, but it indicates that treatment should be given, especially to ward off late visceral manifestations.

Noguchi's discovery of the spirocheta pallida in the brain and cord tissue put general paralysis and locomotor ataxia 100 per cent in the syphilis category. Malarial treatment for paresis, while not 100 per cent perfect in any sense, offered us a method in treating a previously fatal condition, and in which we now obtain in some cases very good results.

Bismuth and tryparsamide have also been adjuncts in our therapy.

The above methods have reduced syphilis to a minimum, especially in Minnesota, which is the only region I personally know about. In my office, a primary lesion is a rarity; and, in talking with other dermatologists, their experience seems about the same. At the Ancker Hospital in St. Paul, there have been two primary lesions in the out-patient department in the last six months; and at the University Hospital there have been about ten during the last year.

Wassermann tests on 5,000 University students gave five positives, three of which were congenital, one extragenital, and only one contracted by sexual intercourse. Dr. Cole told me that, at the Shriners' Hospital for Crippled Children, a positive Wassermann is a rare occurrence. And I received the same report from Dr. Hedenstrom at the Baby Welfare Clinic in St. Paul.

Syphilis is, and always has been, a social problem; but it is definitely under control and is disappearing rapidly; this, in my opinion, is due to the above discoveries which I have mentioned, and not by "educating the public," which, to me, is more or less of a myth pertaining to things medical.

DR. GORDON KAMMAN, St. Paul: I was glad to hear Dr. O'Leary say that, in the treatment of neurosyphilis, he feels that malaria is more effective than any other forms of pyrotherapy. Walter Freeman, of St. Elizabeth's in Washington, D. C., has shown that malaria produces a reaction in the reticulo-endothelial system that does not appear in other forms of fever therapy. I suspect that the participation of the reticulo-endothelial system has something to do with the resorption of the perivascular exudates that we see in neurosyphilis. In Von Jauregg's Clinic in Vienna, I recall seeing sections in which the actual passage was shown of perivascular exudates through the walls of the capillaries. This connotes a change in the permeability of the endothelium that is produced by the dynamic action of the malarial parasite. This action cannot be produced by the various other methods of artificial fever production. Malaria seems to be the only agent that causes this type of reaction. This undoubtedly has a bearing on the relative merits of malarial therapy and other forms of fever therapy. I think statistical studies tend to show that malarial treatment produces a higher percentage of remissions than other forms of fever therapy.

I would like to ask Dr. O'Leary whether or not insufficient early treatment is worse than no treatment, or whether insufficient early treatment really does help.

DR. F. R. WRIGHT, Minneapolis: Regarding the treatment of late syphilis, it is not the temperature at all which does the work. It so happens that in malaria an immunizing agent is produced which, at certain stages, produces a positive Wassermann. Instead of the temperature, it is the theory that malaria produces some immunizing body which kills the spirocheta.

BOOK REVIEWS

DR. S. E. SWEITZER, Minneapolis: In general we find that the neurologists feel that these patients who have no active symptoms should not be actively treated. But I feel that we should treat the so-called preparesis with malaria and intensive post-malarial treatment with arsenic and bismuth so that they will not get paresis. The figures which Dr. O'Leary has given us tonight show that very well.

DR. H. L. ULRICH, Minneapolis: The only vector for syphilis is the human body. We cannot kill the vector, so we must destroy the *treponema pallidum*. The acceleration of this destruction lies in the improvement of our arsenicals. My criticism of the specialists is due to the fact that in the last thirty years they have fallen down. The only benefit I can see in a campaign is not one of education but one of propaganda which would emphasize the early treatment of syphilis.

DR. PAUL O'LEARY, Rochester: The people of Minnesota are indeed fortunate in having had, back in 1921, two men interested enough and with sufficient vision to have created a venereal disease program that has become a model for this country. I refer, of course, to Dr. H. G. Irvine and Dr. A. J. Chesley of the State Board of Health. Even when the funds which were originally set aside by the state legislature were discontinued, Dr. Chesley and Dr. Irvine were able to carry on a campaign that has maintained a state serologic laboratory of the highest type, that has supplied drugs to physicians for the treatment of indigent patients with gonorrhea and syphilis, and that has maintained a consultation service for the physicians of the community. The adoption of the Minnesota plan by the national health officers as a model type of program should indeed be a source of satisfaction and encouragement to these two pioneers in the venereal disease campaign.

In answer to Dr. Kamman's question, I believe very decidedly that the modern treatment of syphilis does not produce neurosyphilis but rather that it actually prevents its development. The basis for this assertion is that, of a group of 500 patients with clinical neurosyphilis, 72 per cent had not been treated for syphilis when the neurologic disease was recognized. Of those who received treatment, even though it was insufficient in amount according to our present-day standards, only 8 per cent developed clinical neurosyphilis. Likewise, when we studied those patients who were given the recommended amount of treatment, only 4 per cent showed either invasion or involvement of the central nervous system. The statistical evidence is decidedly in favor of the modern treatment of syphilis as the best "preventer" of neurosyphilis we now have at our disposal.

The successful serologic and clinical results that follow malarial therapy are apparently not due to any symbiotic reaction between the plasmodium vivax and the spirocheta pallida, as Dr. Wright mentioned. The reason for this is that other types of organism, spirochetes and bacteria, as well as the by-products of these organisms, have produced equally satisfactory results in the patient with syphilis; but there use has not become popular because of controllable complications or the inability to control the disease produced.

DR. F. R. WRIGHT: Answering Dr. O'Leary, I might say that the spirocheta does not live in the blood stream; it lives in the tissue fluids. Fever alters the character of these fluids. That is what happens when you treat gonorrhea with heat. Forty years ago they taught at the clinic in Vienna that only 2 per cent of the cases treated by mercury for over three years would develop neurosyphilis; so, if the figures Dr. O'Leary just gave are correct, and these old figures in Vienna are correct, from a neurological standpoint the end-

results have not improved much in the treatment of syphilis.

The meeting adjourned.

ALBERT G. SCHULZE, M.D.,
Secretary.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MENTAL THERAPY. Studies in Fifty Cases. Louis S. London, M.D., formerly Assistant Surgeon (R) United States Public Health Service; Medical Officer United States Veterans Bureau; Assistant Physician, Central Islip State Hospital, Central Islip, New York, and Manhattan State Hospital, Ward's Island, New York. Cloth. Price, \$12.50. Two volumes, pp. 774, with 22 diagrams. New York: Covici, Friede, 1937.

These two volumes present fifty case histories of various types of neuroses and psychoses. The larger part of this work is taken up with cases of sexual neuroses. The author is a student of Freud's school of psychoanalysis and uses Freud's interpretation in his analyses. Is is very questionable that this work will, as the publishers aver, displace Krafft-Ebing's "Psychopathia Sexualis," mainly because only a comparatively few types of sexual perversion are discussed. The title, "Mental Therapy," is misleading for a large proportion of the case histories have no mention of therapy. A more accurate title would be "A Freudian Interpretation of Fifty Cases of Neurosis, Sexual Perversion and Psychoses, with Emphasis on Sexual Perversion." For those who cannot stomach psychoanalysis this contribution is not recommended. For those who do believe in psychoanalysis it offers nothing essentially new.

N. J. BERKOWITZ, M.D.

MANUAL OF DISEASES OF THE EYE. Charles H. May, M.D. 498 pages. Illus. Price \$4.00. William Wood and Company, 1937.

This work first published in 1900 has now gone through fifteen editions and while it contains almost 500 pages it is still of convenient size.

For the undergraduate and general practitioner it is perhaps the most ideal work of its kind. Diagnosis and treatment have been brought up to date; selected operations for the respective fields have been well chosen, clearly described and illustrated; and the colored plates are especially illuminating although former editions had similar plates.

That the work has great merit is evident by the fact that it has been translated and printed in several editions in eight foreign tongues.

GEORGE C. DITTMAN, M.D.

MINNESOTA MEDICINE

PROCEEDINGS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, January 6, 1938

President, DR. O. W. YOERG, in the Chair

THE USE OF FASCIAL TRANSPLANTS IN HERNIOPLASTY*

STANLEY R. MAXEINER, M.D., F.A.C.S.

Erdman, in a follow-up of 978 herniotomies on patients over sixty years of age, found 10 per cent recurrences after operations for oblique hernias and 42 per cent recurrences after operations for direct hernias. The regular gut suture method of hernioplasty is followed by 15-25 per cent recurrences in direct hernia and 40-50 per cent failures after operation for recurrent hernias. This is not due to faulty technic when all the surgical indications have been complied with, namely, removal of the sac, proper approximation of tissues, primary healing, and an adequate healing period.

Reoperation reveals that the tissues have not remained as they were approximated surgically, but have separated and returned to their original position with the formation of a new sac. The answer must be found in the deficiency of the healing process.

Healing takes place first by the advent of inflammation followed by new fiber cells and blood vessels resembling granulations which eventually become scar. Two edges of fascia sutured together become united by scar whether approximated edge to edge or overlapped. Union of fascia to muscle takes place by the formation of new scar joining the fascia to the fibrous covering of the muscle bundles. It naturally implies, therefore, that approximation must be maintained until adequate scar is formed to insure against stretching and separation under stress. Absorbable sutures often fail to accomplish this objective. Non-absorbable sutures, on the other hand, if they do not cut out under tension are found to be incorporated in a strong bed of scar. Experimentally, Mootz, Selig and others found that removal of intervening areolar tissue and scarification of approximated surfaces aids the security of the healing process.

Gallie in 1921 reported his work, experimental and clinical, on the use of living fascial sutures and grafts. Free grafts were found to shrink and became joined to hernial rings by wide areas of scar tissue. This was overcome by the use of grafts resembling the many tail binder, the tails being sewed into the surrounding tissues. Fascial strips cut from fascia lata and used as sutures were found to be stronger than catgut or kangaroo tendon and were less irritating to the tissues, producing little or no reaction. They became incorporated in the healing scar and were demonstrated two to five years later as persistent fibrous

cords of equal tensile strength and unshrunk as demonstrated by spacing silk markers along the sutures. McArthur in 1901 described the use of a fascial suture procured from the medial cut edge of the external oblique and left attached at the pubes. We used his method successfully in the early days of my association with Dr. Farr but it was later only seldom employed. Recently, however, popularity seems to have returned it to its just place in surgery. Our own experience based on 383 hernias repaired by the McArthur fascial suture has reduced our recurrences three and a half times when used in the repair of direct hernia. We have reserved the McArthur operation for the milder type of direct hernia, some selected recurrent hernias, and certain indirect hernias in older persons.

The Gallie operation is more radical and has been reserved for post-operative incisional hernias where the edges can not be brought together without too much tension or where a gap actually remains between the edges. This gap is darned with fascial strips as one might mend a sock. We have recently repaired all recurrent inguinal hernias by this method. Large umbilical hernias, selected femoral and epigastric hernias and certain large long-standing indirect hernias where tissues are weak lend themselves best to the Gallie method of closure.

Gallie in 100 herniotomies, most of which were for direct or recurrent hernias, had no recurrences although three wounds suppurated. Burdick in 163 cases, twenty-nine of which were for recurrence, had four recurrences only. Behrend performed 125 operations with three recurrences and recommends the use of fascial sutures in practically all herniotomies. Burdick, Gillespie and Higinbotham (Am. Surg., 1937) report the only adverse criticism found in the literature reviewed by the writer. However, they report 133 infected wounds in 1,485 cases, 7.9 per cent of the wounds with autogenous sutures and 12 per cent with ox fascia being infected. Of 975 followed operations of all types of hernia 284 failures occurred. They report 15.4 per cent recurrences in indirect hernias with the use of fascia and now employ silk sutures almost exclusively. These statistics are not as good as those obtained by the use of catgut and their percentage of infections is very high.

In discussing sutures Koontz remarks as follows:

A (1) Catgut is uncertain as to its duration and may disappear before the healing process is complete; (2) in the presence of collected serum it softens and often unties; (3) unfavorable reaction to the tissues about the sutures is common.

B. Silk is not absorbed and is more dependable and there is very little reaction in the surrounding tissues.

*From the Department of Surgery, University of Minnesota.

The objection to silk is based on the grounds that it is a foreign body and often leaves a sinus or it may cut through.

C. Animal fascia preserved in alcohol (70 per cent) still has collagen fibers undestroyed and live cells penetrate and incorporate the sutures as in a graft of autogenous fascia.

Autogenous fascial sutures do not absorb but continue to function for all time. They are strong and easily procured. Fascia may be used as a graft, pedunculated flap or as a suture. Fascial sutures may be mounted on a Gallie needle or may be pulled through by small forceps which penetrate the layers to be united. The strip should be anchored at regular intervals, preferably with silk, as fascia is very slippery. Defects may be darned by strips or the layers may be brought together by the ordinary running suture if there is no undue tension.

Personal cases from our own private practice consist of twenty-eight hernias repaired by fascia; fourteen by the McArthur method and fourteen by the Gallie technic.

At the Veterans Hospital at Ft. Snelling, Dr. Sedgely, Dr. Culligan and I have performed 405 herniotomies by using fascial transplants. There have been 372 operations of the McArthur type and thirty-three operations of the Gallie type.

Among the writer's twenty-eight patients there has been one infected wound with prompt failure. This was a strangulated hernia recurrent seven times in which we ill-advisedly attempted to do a Gallie suture to obtain permanent relief. The infection in this instance was unquestionably due to the presence of bacteria from the incarcerated bowel. None of the other twenty-seven cases became infected and there have been no recurrences to date.

In order to completely clarify my stand on the use of fascia I would state that I am not recommending the use of fascia for the ordinary indirect hernia, especially in young people, where even the removal of the sac alone may be adequate, but I am advocating its use as stated in the text and in the report of the following cases where, in my judgment, catgut closure is apt to be followed by failure. Occasionally one hears the statement that removal of fascia lata strips from the thigh may be followed by muscle hernia. We have not experienced this condition as yet in forty-seven cases in which we have removed strips of fascia lata. Following the rendering of the above paper, ten cases treated by the Gallie and McArthur operations were personally shown as a clinic. Six of the most interesting ones are herewith reported.

Case 1.—Mr. F., aged sixty-five, has had two herniotomies on the left side in 1911 and 1919 and one herniotomy on the right side in 1919, all of which recurred. The patient has been treated by hernia injections on both sides for a nine-month period without improvement. In August, 1936, the right (which is giving the most symptoms) twice-recurrent hernia was repaired by the Gallie technic using three strips of fascia lata one-fourth to one-third inch wide. One and a half years later the closure is entirely satisfactory. The

left side has not been operated upon because the patient has subsequently had an attack of coronary thrombosis. Nevertheless he has returned to his regular occupation as stationary engineer.

Case 2.—The patient, male, aged fifty-four, was operated upon for a ruptured appendix with drainage thirty-seven years ago. This operation was followed promptly by a large ventral hernia. The ventral hernia was repaired twelve years ago by the catgut method but again recurred one year later. He was treated by eight injections in 1935 without relief. He had been treated for angina pectoris for the preceding two years and suffered severe pain on exertion. He complained bitterly of pain and symptoms of partial obstruction. The hernia was about the size of a large grapefruit medial to the right anterior superior spine, was irreducible and painful. In June, 1936, under local anesthesia a plastic repair of the ventral hernia was performed. A large double hernia in the right groin and loin was found at the time of the operation. It was impossible to reduce the hernia without opening the sac and separating the adherent loops of bowel. The fascia layers were carefully dissected out and were grossly inadequate to assure a competent closure. Three wide strips of fascia lata were woven into the defect after bringing the layers together with catgut. The patient complained of angular pain during the operation and required supportive treatment. It is now nineteen months since this operation without recurrence and the scar is entirely competent.

Case 3.—Mrs. C., female, aged forty-four, was operated upon seven years ago for cholecystectomy. Five years ago she developed an incisional hernia which has increased to tremendous proportions. The hernia was larger than a coconut and was producing symptoms of partial obstruction. At operation January, 1934, the old scar was excised, the bowel loops freed and reduced, the fascial layers freed and separated and a plastic repair of the hernia was completed using three wide strips of fascia lata. It is now more than four years since this hernioplasty and there is no recurrence and the wound is entirely competent.

Case 4.—Mr. K., aged forty-three, had a history of recurrent bilateral inguinal hernias. The patient was operated upon one year previously for bilateral hernias both of which recurred within three months. Following the recurrence the patient was treated with many injections without result. Operation: bilateral plastic herniorrhaphy after the manner of Gallie using three strips of fascia lata on each side. The primary repairs were both performed at the same time while two weeks intervened between the right and the left secondary repairs. It has been our custom not to do two hernias at one time as it is our opinion that much better results can be obtained by performing them at intervals of at least two weeks.

Case 5.—Mr. L. A. J., aged thirty-eight, came to us with a hernia three times recurrent on the right side and two times recurrent on the left side. Both sides were repaired by the Gallie technic in January, 1933. It is now more than five years without recurrence. His occupation demands more than usual heavy exertion.

Case 6.—This is one of the most outstanding cases it has been my privilege to encounter inasmuch as the patient has had nine recurrences following operation for repair of the inguinal defect. Mr. M., aged forty-four, suffered a gun-shot wound of the right inguinal region in France in 1918. An operation was performed in an attempt to remove a machine gun bullet through the inguinal region without success. A second operation was performed removing the bullet

by approaching it from the rear of the right thigh. The inguinal wound suppurated and necessitated removal of slough and fragments of bone. A hernia subsequently developed from which the patient has been operated upon subsequently nine times. At the last preceding operation the surgeon ingeniously withdrew the testicle from the scrotum, passed it behind the right rectus muscle, out the midline and back again into the scrotum and then closed the inguinal canal. This was followed not only by hernia in the inguinal region but likewise one in the midline where the cord emerged from behind the rectus. In October, 1937, the patient agreed that we might remove the testicle or resect the cord if we thought it would give him a better chance of a permanent cure. Operation: a long oblique incision was carried downward over the inguinal canal into the midline over the pubis. The cord was exposed in the inguinal canal following beneath the rectus muscle and to the scrotum as described. Under the circumstances we reasoned that the testicle having been delivered from the scrotum must have developed a new collateral circulation from adhesions to the surrounding tissue. For that reason the testicle was not removed but the cord was doubly ligated and completely excised to the peritoneum. The midline hernia, the rectus sheath, and the inguinal canal were now closed tightly, using three, more than ordinarily wide fascial strips. The layers were imbricated and deep bites were taken into the normal tissue on both sides of the approximated tissues. It is now only four months since the last repair which was done by the Gallie fascial strip technic and it is altogether too early to report the result of this operation. However, we believe that we have given this patient his best chance for a permanent cure. It is interesting to note that there was no swelling of the testicle following the division of the entire cord and it remains the same size as the testicle on the opposite side.

Motion pictures in color of fascial operations performed by both Drs. Culligan and Maxeiner were shown demonstrating the technic of the two types of fascial strip operations.

Discussion

DR. LEO CULLIGAN: In 1931 when we first started using fascia in the repair of hernia at the Veterans' Hospital, we limited its use to large ventral hernias, the larger recurrent hernias, and those recurrent hernias which had come back more than once. For that reason, during the next three years, we used it in only nine cases, all by the Gallie technic. In February, 1934, we became interested in the old McArthur operation originated by him in 1901. The use of this simple and effective means has so widened the scope of the use of fascia that up to the present time we have used it in 406 cases, thirty-three of these by the Gallie technic, and the remainder by the McArthur technic.

From the experimental work of many men we know that fascia as a suture material persists and does not absorb. Some men say that it continues to live much like transplanted skin lives. Others say that it persists as an inert tendinous structure which becomes infiltrated from the surrounding tissues. However, all agree that it is not absorbed, and that it will continue to hold tissues together in place where one sutures them.

From our own experience at the Veterans' Hospital we know that fascia is an innocuous kind of suture material. The wounds in which it is used heal readily without irritation and without any undue formation of serum. We have had a low incidence of infection, somewhat higher percentage in the Gallie than in the McArthur operation, yet the series using the Gallie technic is so much smaller that the comparison is hardly accurate. In the Gallie we have had four in-

fections in thirty-three cases (12 per cent), while in the McArthur herniotomies done during the last year, amounting to 132 operations, we have had only two infections (1.5 per cent). In all our cases, even those which have become infected, we have never had a fascial strip slough. A year ago in a paper before this society I compared the results of the use of catgut and fascia in the repair of the direct hernia. At that time I showed that we had approximately three and one-half times the recurrence rate using catgut that we had had using fascia.

In view of this satisfactory experience I now use fascia almost as a routine in the direct hernia, the large indirect hernias, sliding hernias, the ventral hernias, and the recurrent hernias. Whenever possible I use the McArthur technic.

Because I prefer this simpler McArthur technic in repairing the recurrent inguinal hernia I do not use the suggestion of Gallie to take the fascial strips from the thigh before opening the herniotomy wound, for I have found that in the majority of these cases one can get sufficient fascia locally to make a satisfactory repair. Possibly it is just that I have a weakness for the method of McArthur. However, it has been my experience that in most recurrent inguinal hernias the defect is a small one, often not larger than two or three centimeters in diameter, and for that reason one does not need a great deal of fascia to make a good repair. Moreover, the repair of the recurrent hernia using fascia, can be different from that using catgut in that it is not necessary to break down the floor of the canal in order to get sufficient tissue to overlap and make our closure in that way. All we have to do is to pull the edges of the defect together with fascia and they will hold where we put them.

So in repairing the recurrent inguinal hernia, after dissecting out the defect, I have been taking a strip of fascia from the adjacent aponeurosis of the external oblique, leaving it attached near the fascial defect and using it is suture material. I have been able to use this method in the last thirty-two consecutive recurrent inguinal hernias upon which I have operated and as yet none of them have returned for reoperation. On the other hand when the defect is large, and I cannot get sufficient fascia locally to make the repair, I go to the thigh and take enough fascia to make a firm closure.

On the whole, our experience with fascia has been so satisfactory that now whenever I operate any hernia, especially in a patient over the age of thirty-five or forty, I ask myself the question, "Why not use fascia?" As time goes on it is becoming increasingly difficult to find sufficiently good reasons for not using it.

DR. FRANK R. SEDGLEY (by invitation): This would be a wonderful opportunity to review the history of the surgical treatment of hernia from prehistoric times, but I will refrain owing to the length of the program this evening. Until the advent of modern surgery no real progress was made in the treatment or the understanding of hernia. The subject remained in the same status as during the Dark Ages.

There were three factors that changed the situation. These were the principles of antisepsis and asepsis, improved surgical suture material and a better understanding of the anatomical relations to the lines of intra-abdominal force, intra-abdominal pressure and especially the stresses that occur upon the operated structures. The Bassini and Halstead operations, as well as a score of others that bear proper names, reflect the progress of development of a better anatomical understanding.

The first two factors preceded and were necessary to the development and application of the anatomical principle in the same degree that they were and still are fundamental to the development and progress of

modern surgery. Asepsis is an absolute term and implies, naturally, a perfection in that particular direction, but it is a perfection that is practically obtainable. Surgical sutures nowadays are excellent and for wide general uses are near to perfection but in the special field of hernial surgery with its transposed anatomy, the three factors do not combine as effectively as in many other circumstances. The use of living, autoplasmic fascia, I believe, represents, if not perfection, at least a distinct improvement in the suture factor. It may be thought of as bearing the same relation to other sutures as vital staining of the blood and other tissues does to ordinary staining methods. Whether there is anything essentially vital in it or not, one warning should be borne in mind: the fascial strip, whether free or pedicled, remains a suture still and as such must be carefully applied. It has such a smoothly sliding, sleek quality that it must be firmly anchored in its position at several points to insure its fixation and later incorporation where desired. This is done with accessory sutures of plain and chromic gut, or silk as may be preferred.

I want to express my appreciation of Dr. Culligan's laborious and painstaking efforts in going over our large number of cases at the Veterans' Hospital and I anticipate that his analysis of our present practice continued over a longer period will show a definite improvement in our own recurrence rate, and especially in results of operative procedures on recurrent hernias.

DR. WILLARD D. WHITE: In these cases that have to be operated on for bilateral hernias, do you do them both in the same sitting or do you do one and allow it to heal and then do the other side?

I would also like to add that Dr. MacArthur had described this operation in 1901 and then somewhere around 1904 he showed, at a meeting, a patient who had been operated upon in 1901 with this McArthur operation of fascial suture. Then, this patient died from some other cause somewhere about 1904 and he had the specimen removed at autopsy and it showed that the fascial strips that had been placed in the wound nearly four years previously still remained* and you could trace the course of these strips, showing that the strips do actually live.

DR. HAMLIN MATTSON: There is still another possible use for fascia transplants which I tried recently. A primipara, aged thirty-two, suffered a third degree laceration following breech delivery August 21, 1934. Two extensive procedures performed elsewhere had failed. The patient had complete fecal incontinence and absence of the rectovaginal septum for a distance of 6 cm. proximal to the anal sphincter. The tissues showed extensive scarification. On April 22, 1935, the rectum was freed and drawn downward and the remnants of the levator ani muscles sutured. The wound healed well with the exception of the ends of the sphincter, which did not unite. On May 7, 1937, the ends of the anal sphincter were freed and sutured with three strips from the fascia lata. Apparently fascia transplants when buried in poorly vascularized scar tissue are transformed into scar and when in better vascularized tissues remain in as fascia indefinitely. Nevertheless, this patient obtained complete functional control of her bowels.

DR. R. HULTKRANS: Dr. Dunn had a case when I was with him. A man of considerable weight fell and ruptured both quadriceps tendons. They were completely ruptured because he had no power of extension at either knee. Repair was done with fascia lata. Dr. Dunn is here and can probably tell us about it.

*This statement was made in a discussion, by Dr. E. S. Murphy, of a paper on fascial sutures in the repair of inguinal hernia by W. J. Pickett, Illinois Medical Journal—Vol. 59, p. 227, March, 1931.

DR. GEORGE R. DUNN: This was a rather heavy chap and he evulsed the quadriceps tendon at the top of each patella. We used fascia lata in restoring them. He got practically a perfect result on one side and a fairly good result on the other side. He weighed, after considerable reducing, about 265 pounds. The use of the fascia was about the only way we had of restoring the continuity of the tendons. There was no fracture, simply an evulsion of both quadriceps tendons from the patella on the right and left sides.

DR. STANLEY R. MAKEINER: With reference to Dr. White's question, I personally have not done a double hernia at one sitting for several years. The man who had a bilateral hernia had a three weeks interval between the two operations. I personally think it is wise to have an interval of probably two to four weeks as the closure of the two hernias undoubtedly exerts additional tension on both lines of sutures and one or both are more likely to give way.

With reference to Dr. Mattson's remarks, I wish to add that they are using fascial strips for almost everything and they have been repeatedly using them in the repair of extensive laceration of the perineum where the tissue is inadequate. At the last meeting of the Western Surgical Association, Dr. Charles Mayo, Jr., showed motion pictures of a new technic in which he used fascia lata for building up the pelvic floor to cure prolapse of the rectum. The exposure is through an incision similar to that used in operation for carcinoma of the rectum. The peritoneum is opened and the rectum and sigmoid is tucked up into the abdomen. Fascial strips are then woven in such a manner that a new internal pelvic floor is made which fits around the rectum. They had a very successful result in the one case which he reported.

FEMORO-ILIAC THROMBOSIS AND THROMBOPHLEBITIS

H. O. MCPHEETERS, M.D.

Much has been written on the subject of thrombosis and thrombophlebitis. The importance of its prophylaxis, care at the time of onset and the treatment of the sequelae that may often follow, has not yet received proper attention. This is well borne out by the splendid presentations the past year. The paper by Homans' is a most complete thesis on the subject, while Edwards* has given evidence as to the destruction of the venous valves in severe cases.

Pathologists and clinicians agree that the first and most important factor in the development of a thrombophlebitis is a slowing of the blood stream. An injury to the intima of the vessel, either traumatic or infectious, furnishes a focus for its development. Blood platelets are then deposited at that area in the slowly moving blood stream. Thrombocytes appear and then fibrin is deposited which enmeshes the blood cells. The process may terminate with only a slight local involvement or it may close the vein lumen and extend in both directions. The extension of the process terminates at the inflowing of collateral veins with a good current. It is the thrombus attached to only a portion of the vein wall and only partially filling the vein lumen that is provocative of most of the emboli. There may be sufficient current present at times to

carry a portion of the poorly attached thrombus, which may become loosened by exercise, in a proximal direction.

The infection is hematogenous, and may arise from some distant focus, or may be by way of the lymphatics. In the latter case it is thought to be carried in the perivenous lymphatics and then to involve the vein wall from the outside by direct extension. It then penetrates the wall and causes an inflammation of the intima to initiate the thrombophlebitis. Barker² has discussed primary idiopathic thrombophlebitis and cites cases in which no probable source of the infection was ever found.

Homans³ has divided thrombophlebitis of the lower extremity as follows: deep femoro-iliac thrombophlebitis commonly called "phlegmasia alba dolens"; deep peripheral thrombophlebitis involving the deep cavernous veins of the calf; thrombophlebitis of varicose veins; thrombophlebitis of non-varicose veins.

At this time I wish to discuss only the deep femoro-iliac thrombosis and phlebitis and present three case reports of patients who, I believe, had this condition. In each case the symptoms were so acute and severe as to leave no doubt but that the pathology was initiated in the femoro-iliac segment of the vein. The onset of the condition in each case was rapid and the symptoms of thrombosis were more prominent than those of phlebitis. The condition is most dramatic for both the doctor and the patient. In one case the onset and pain was similar to that of an arterial embolus.

Case 1.—Mrs. T., aged forty-eight, a housewife in good general health, three years previously had stumbled on the steps and bruised her left knee and leg over its outer and middle surface. Following this she recovered with bed rest. One year later and more than a year before I saw her, she complained much of a pain along the crest of the left tibia and the outer middle third of her left leg. There was also a sharp pain at times in the left mid-thigh. This was along the distribution of the left femoro-cutaneous nerve. Both she and her home physician associated both these pains with the fall of three years previously and with some small varicose veins that had developed since.

Careful examination showed the patient in good general health and with no complaints other than the above described pains and the few varicose veins. I advised both her doctor and the patient that I did not think the varicose veins were the cause of the pains but suggested that we inject them to rule them out. The varicose veins were injected with sodium morrhuate 5 per cent with good results and the usual local reaction. The original pains still persisted.

Five days after the injections the reaction was rapidly subsiding. The patient was sitting waiting for her husband planning to return home when she felt a pain in the left groin which rapidly became worse. Following this she said the entire leg seemed to feel "full." She came to my office at once, a distance of two blocks, crying with pain. The pain was principally in the groin and upper thigh but also somewhat throughout the entire leg.

Examination showed the entire left leg very cyanotic and swollen. The skin was tense. The cyanosis showed a sharp line of demarcation at the groin which passed outward even with the greater trochanter. It was not more than 3 inches from the normal pink skin above to the deeply cyanotic skin below. The pulsation in the femoral and popliteal arteries was

good. The foot was too badly swollen to permit palpation of the dorsalis pedis. The temperature was normal.

The patient was sent to the hospital. The leg was put in high elevation and hot magnesium sulphate packs were applied. Four hours after onset the temperature was 99; at the end of the twenty-four hours 99.4; and at the end of forty-eight hours it was 100.4. It rose to 100 daily for four days and then dropped to 99 for the rest of her stay in the hospital.

During her stay in the hospital the hot packs were removed for 1 hour at a time twice a day and the electric baker was applied over the entire leg.

There was no medication given directly for the condition itself as I did not think the patient had a true infectious phlebitis. The patient had a great deal of pain and she was kept under sedatives all the time.

She went home by ambulance on the eleventh day and continued the hot wet packs four hours twice a day followed by the electric baker. She continued this treatment for eight weeks. The pain through the entire leg gradually lessened but the original pain in the external thigh and lower leg continued. The leg was painful when held dependent but the patient was urged to be up and about with an Ace bandage on the lower leg. This gave her much relief.

Six months after the onset of her complication she returned and Dr. R. P. Caron injected the painful areas with novocaine and later with quinine and urea hydrochloride 1—600. This was repeated one month later. Today the patient has recovered almost completely. She has no pain but does wear an elastic stocking which easily controls the swelling.

In this case the thrombosis must have been either the result of an idiopathic phlebitis, as suggested by Barker, or the delayed result of the injections, a condition such as I have never seen before, even though the reaction from the injections was only the usual amount and that was rapidly subsiding.

Case 2.—Mrs. W., a housewife, aged forty-four, had an attack of influenza in February, 1937, and was bed-fast for three weeks. In bed, while convalescing, she suddenly developed severe pains through the left inguinal region and throughout the entire left leg. Four hours later, by daylight, she noticed that the entire left thigh and lower leg was of a greenish, cyanotic color. Both pain and cyanosis were aggravated on standing. The patient did not have a chill and the doctor said her temperature was normal.

She was sent to the hospital for five weeks, where two blood cultures were negative. There was only a moderate swelling of the leg during that time, while in bed, but it did swell and the pain was worse as soon as she would get up and about.

After another four weeks in bed at home she began to get up and about with an Ace bandage on the lower leg. Without it the lower leg to the knee would become dark, cyanotic and swollen.

The attending physician at that time diagnosed the condition as a femoro-iliac thrombosis and not a thrombophlebitis.

The patient was first seen by me on September 1, 1937, at my office. The entire left leg, from the groin to the toes, was larger by actual measurement than the right leg. The skin was definitely cyanotic in relation to that of the right leg and the abdomen. The patient was wearing an Ace bandage on the lower leg. When this was removed there was but slight edema and the color was good. The femoral, popliteal and dorsalis pedis arteries were normal. The left great saphenous vein was palpable and only half an inch in size, not at all large enough to be considered a compensatory vein. Tests proved it was not. After the

bandage was removed the leg became discolored and there seemed to be a definite line of demarcation of the cyanosis about the level of the knee. After a forced walk of four hours without the bandage the swelling was only moderately increased and the color was good. The leg rapidly became cyanosed on standing. I advised her to continue wearing a Lastex stocking and go about her work.

On November 18, 1937, the patient reported that she had led a normal life, including dancing, and felt fine. She was not handicapped by the leg. There was still some cyanosis and swelling of the lower leg to the lower thigh when going without the supportive stocking.

Case 3.—Mr. S., aged fifty, a millwright, had an injury to the left ankle and foot many years previously. Two years before the present illness I treated him for a bad varicose ulcer and injected a large group of varicose veins. The patient was last seen one year previously. On December 30, 1936, he presented himself at the office with the history of having had the varicose ulcer recur two weeks previously but stated that it was rapidly getting worse. He also had had a severe pain develop in the left groin the day before, following which the left leg became cyanotic and badly swollen.

In his case, examination of the left leg showed the same line of cyanotic demarcation at the groin as described in Case 1, but he also showed an extensive fungous or ringworm infection over the entire inner ankle and lower leg. There was also much inflammation in the tissues in this area. This case was thought to be a definite infectious thrombophlebitis and the patient was given four intravenous injections of gentian violet 0.5 per cent, six of Creohex and six doses of Edwenil subcutaneously.

In spite of all treatment and consultation the condition spread upward into the iliac veins, with an involvement of the right iliac and femoral veins and a septic lung embolus with later abscess formation. The patient finally died of a rupture of the lung abscess into the bronchus and an acute pneumothorax. At the autopsy a thrombus was found to be completely plugging the inferior vena cava, four inches above the bifurcation at the pelvic brim. This thrombus was firm and was of at least several days' duration.

The most important phase of the treatment of thrombophlebitis is its prophylaxis. This is accomplished by exercise and doing all those things in the individual case that will aid venous drainage. Tight abdominal postoperative binders should be avoided as much as possible. The patient should be urged to move the legs actively as early as possible and several times a day. Thyroid gland given before and after operation increases the circulatory rate. The patient should walk immediately after an injection treatment of varicose veins and be up and about the house every two hours after the preliminary ligation and injection of veins. This avoids the stasis in the deep veins of the calf which could be injured by the injected solution. In Sweden⁹ a mortality rate of 0.33 per cent following the combined ligation and injection treatment has been reported. This is higher than for the former resection operation of years ago which was given as 0.26 per cent. This I am satisfied is due to the surgeon demanding bed rest for his ligation cases.

For the active treatment of the individual case, elevation of the extremity and hot packs from toes to abdomen with the electric light baker at hour intervals four times daily seem to give the best results. Medication has been of little help. Sulfanilamide should be tried and in some cases the intravenous use of 0.5 per cent aqueous solution of gentian violet does seem to help.⁷ Murphy⁴ claims excellent results with mecholy iontophoresis in the treatment of the

chronically indurated and inflamed lower leg so commonly seen after phlebitis.

Summary

Thrombophlebitis of this particular type is in my experience very rare. The three cases presented were, however, seen this past year. Though radical surgery has been advised in the way of ligation of the vein above the thrombus,^{5,6,8} I believe that the above method of expectant treatment is to be recommended.

Bibliography

1. Bancroft, F. W.: Proximal ligation and excision of veins for septic phlebitis. *Ann. Surg.*, 106:308, 1937.
2. Barker, Nelson W.: Idiopathic thrombophlebitis. *Arch. Int. Med.*, 58:147, 1936.
3. Edwards, E. A.: The effect of thrombophlebitis on the venous valve. *Surg., Gynec. and Obst.*, 65:310, 1937.
4. Fontaine, R., and Pereira, A.: Obliterations et résections veineuses expérimentales. Contribution à l'étude de la circulation collatérale veineuse. *Rev. de chir.*, 56:161, 1937. (*Abstr.*) *Internat. Abstr. Surg.*, 65:347, 1937.
5. Homans, John: Venous thrombosis in the lower limbs: its relation to pulmonary embolism. *Am. Jour. Surg.*, 38:316, 1937.
6. Murphy, H. L.: The treatment of thrombophlebitis with acetyl-beta-methyl choline chloride iontophoresis. *Surg., Gynec. and Obst.*, 65:100, 1937.
7. Neuhof, Harold: Excision of vein for suppurative thrombophlebitis. *Ann. Surg.*, 106:308, 1937.
8. Stanley-Brown, M.: Intravenous injections of gentian violet in the treatment of phlebitis. *Surg. Clin. No. Am.*, 8:1031, (Oct.) 1928.
9. Westerborn, A.: Ueber die Emboliegefahr bei Injektionsbehandlung von einem nebst einem Bericht ueber die in Schweden vorgekommenen Emboliefaelle. *Acta chirurg. Scand.*, 79:321, 1937. (*Abstr.*) *Intern. Abstr. Surg.*, 65:340, 1937.

Discussion

DR. CARL O. RICE: Dr. McPheeters has described three very interesting cases. In view of the fact that this condition is relatively so uncommon, it is difficult to say a great deal about it.

It appears that these cases are a bit different from the ordinary milk leg, or infectious thrombophlebitis, which is not infrequently observed postpartum. The report of these cases suggests that at least two of them were not initiated on an infectious basis.

The first case seems to suggest that the thrombophlebitis was the result of the chemical irritation from the injected sodium morrhuate. On the other hand, one is inclined to speculate as to why it should occur in this case and not in thousands of others similarly.

When we investigate the causes of venous thrombosis, we find that they may be classified into three different groups.

1. These may be disorders in the vein wall (injuries, inflammation, etc.). Homans states that in large veins the initial change in the intima of the vein may not necessarily be present. He has described exploratory operations in cases with iliofemoral thrombophlebitis in which he found a definite exudative reaction about the common and external iliac arteries. This, he believes, might be considered a deep perivascular lymphangitis—the etiology of which he has not determined.

2. Disorders of the blood, chiefly in the form of dehydration, have been described as another cause for thrombophlebitis. Dehydrated and debilitated individuals more frequently develop thrombophlebitis than comparatively healthy persons.

3. Disorders of the venous return may be due to general circulatory failure, or to factors which cause the blood flow to be slowed up. Among these are, postoperative inactivity, immobilization of extremities, pelvic masses, etc. The anatomical position of the external iliac and the common iliac veins in passing behind their corresponding arteries may also be a

factor, in the inactive bed patient, in causing the delay in the venous return.

Homans has described the following different varieties of thrombophlebitis:

1. Deep (femoroliac) thrombophlebitis, sometimes described as phlegmasia abladolens. This is a not uncommon type of thrombophlebitis. If it produces a great deal of swelling it indicates greater extensiveness. There may be instances in which a thrombus may exist and may break off, causing a pulmonary embolus without having given any evidence of its previous existence.

2. Deep peripheral thrombophlebitis, which involves the veins in the muscles of the leg.

3. Traumatic and infectious thrombophlebitis, which does not have its origin in varicose veins.

4. Thrombophlebitis in varicose veins.

5. Migrating thrombophlebitis. This is a condition in which the thrombus extends toward the heart within the vein, and lies attached at only one point. In endeavoring to explain these three cases which Dr. McPheeters has reported, it seems possible that in the first case this may have been a factor, with the migrating thrombus having taken its origin from the chemical thrombus below.

In the other two cases, it is difficult to state what might have been the origin. The second case may have been similar to those which Homans has described as having a perivascular lymphangitis. The third case in which there had been a varicose ulcer and infection, may have been an infectious thrombophlebitis.

I agree that the best treatment for these cases is that which Dr. McPheeters has described: elevation, dry heat and early graduated exercises.

* * *

DR. H. O. MCPHEETERS: In conclusion I wish to emphasize one point. The relief from the peripheral neuralgic pain was so complete and so easily obtained that next time I will inject the painful areas first and the varicose veins later.

THE THERAPEUTIC EXPEDIENTS IN THE MANAGEMENT OF ACUTE INFECTIONS OF THE EXTREMITIES

OWEN H. WANGENSTEEN, M.D.

Abstract

Immobilization and elevation are of the greatest importance in the treatment of acute infections of the extremities. The most rigid immobilization is best achieved by placing the extremity concerned in a plaster of paris cast including the body trunk. Immobilization reduces muscle movement to a minimum. It also decreases the risk of dissemination of infection via the lymphatics; in addition it also reduces lymph production.

Accompanying all infections of the soft tissues swelling occurs, in consequence of the capillary injury. The extent of the swelling is limited by the occurrence of a high tissue pressure or tension which tends to delimit filtration from the capillary bed. Elevation of an infected extremity in a fixed position as high above the heart level as can conveniently be done with comfort to the patient, succeeds in early reduction of the swelling. Swollen tissues favor spread of the infection.

Bier's hyperemia in the treatment of acute infections of the extremities is physiologically unsound in that it increases venous pressure and consequently capillary pressure and augments filtration of fluid from the capillaries into the tissues. Heat also accentuates capillary permeability and is not to be used with an infected extremity in a dependent position.

The relief which has attended elevation of an inflamed member in an elevated position has been striking. The essayist has the impression that less extensive surgery need be done if immobilization and elevation are employed early in the treatment of infection. In acute osteomyelitis a body plaster is applied with a window over the tender area. When evidence of a subcutaneous abscess is present, an incision is made. Joints are similarly immobilized but incisions are made early and drainage secured by positioning. Fresh burns are treated in plaster with vaselized shirting over the burned area.

Discussion

DR. J. M. HAYES: As Dr. Wangensteen has said, one important factor in the treatment of all acute infections is immobilization. I am going to confine my discussion to these very acute infections, in which you have a severe lymphangitis and adenitis, from fifteen to twenty hours after a small wound on the extremities becomes infected.

Many years ago after spending a year in the University Hospital, I went out to practice in the country. In one particular area, not far from where I was located, it seemed that an epidemic of severe streptococcus infections developed. In a short period of time a large number of these cases came in with severe infections. It seemed that almost every one who got a slight pin prick got an infection.

This took place during harvesting and threshing. These patients were mostly farmers and you usually couldn't get one of them into the hospital, until he was ready to drop. We used all the hot applications we had ever heard of but our results were not good.

About this time I read a statement in Ochsner's textbook of surgery, stating that he never had a crippled or deformed hand or loss of life, not even had to amputate a finger, since he learned of this method of treating acute infections of the extremities. I went to Chicago and went out to the Augustana Hospital. Here the late Dr. A. J. Ochsner was just putting one of these dressings on a leg. He told us at that time that his brother, Dr. Ed. Ochsner, had many years ago before observed the application of this dressing in the out-patient department of Cook County Hospital. He didn't even mention the name of the man who applied it. This man only used a saturated solution of boric acid on the dressing but obtained results that attracted Dr. Ochsner. Together with Dr. Kahlenberg, more recently of the University of Wisconsin, he determined to find out more about the use of this dressing. They found with this dressing applied to the extremity, boric acid appeared in the urine in a very short time. Later A. J. Ochsner suggested

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the addition of alcohol and phenol, much the same as the solution we use now.

Before application of this dressing with this latter solution they took material from the infected wound and injected it into the peritoneal cavity of a guinea pig and killed him in twenty-four hours. After the application of this dressing for forty-eight hours, they again took material from the wound and injected it into the peritoneal cavity of a guinea pig and it didn't even make him sick. We have verified these experiments to a small degree and have obtained the same results.

The solution we use now we call Modified Ochsner Solution. There is a formula for a solution dispensed by druggists called Ochsner Solution. This solution apparently was put in there by mistake. It is dangerous and should not be used. The Modified Ochsner Solution may be used on the skin of an infant

for forty-eight hours with no bad results.

I have talked about this dressing for many years in the out-patient department of the University. Dr. Hirshfelder has repeatedly said this solution would not penetrate the tissues more than one-half a centimeter. He is right in the way he applied it but with this dressing the resistant part of the skin is soon mascerated to such a high degree that the solution readily penetrates the tissues. This has been definitely proven. I know this seems like an extravagant statement to some, but when we get one of these cases within the first forty-eight hours of the onset of infection, we promise the patient definitely that we can stop the spread of the infection by the application of this dressing for forty-eight hours.

For the details of the treatment I refer you to MINNESOTA MEDICINE, volume 16, page 255, (April) 1933.

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